CANMET

Canada Centre for Mineral and Energy Technology

Centre canadien de la technologie des minéraux et de l'énergie

REPORT 82-10

CATALOGUE OF CANMET PUBLICATIONS 1981/82

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MINERALS AND ENERGY RESEARCH PROGRAMS
TECHNOLOGY INFORMATION DIVISION

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Publications and papers published or presented by

CANMET scientific and technical staff in 1981/82.

MINERALS AND ENERGY RESEARCH PROGRAMS

TECHNOLOGY INFORMATION DIVISION

CANMET Report 82-10 July 1982

FOREWORD

This catalogue provides a comprehensive listing of publications prepared by CANMET research and professional staff under various report categories during 1981/82. Also included are research reports prepared by outside agencies under contract.

Section 1 provides titles and abstracts of reports prepared under the CANMET Report series. These are based primarily on fundamental or applied research conducted by or on behalf of CANMET and are intended for sale and general distribution.

Section 2 lists titles and abstracts of reports prepared as journal submissions and subsequently published in outside journals or periodicals.

Section 3 contains titles and abstracts of papers prepared for oral presentation to outside conferences and symposia and in some cases for publication in proceedings.

Section 4 lists divisional investigation and technical reports as well as literature surveys. Investigation reports describe the application of established procedures to problems submitted by individuals, industry or agencies outside CANMET. Technical reports describe results of a series of analytical determinations, test procedures, etc. along with interpretations and conclusions.

Section 5 lists declassified divisional investigation and technical reports as described above.

Section 6 contains titles of reports prepared by private research agencies under contract to CANMET describing studies on national mineral resources and energy supply and technology.

Section 7 covers reports describing research conducted by outside agencies supported financially by CANMET.

James E. Kanasy,
Chief,
Technology Information Division

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SECTION 1

CANMET REPORTS

The reports listed below are available at prices indicated from either Printing and Publishing, Supply and Services Canada, Hull, Québec, K1A 0S9 or CANMET Publication Sales and Distribution, Energy, Mines and Resources Canada, 555 Booth Street, Ottawa, K1A 0G1. Microfiche copies may be obtained from Micromedia Limited, Box 502, Station S, Toronto, Canada, M5M 4L8.

001 Monograph 881. (Second Edition). Donaldson, Elsie M. "Methods for the analysis of ores, rocks and related materials"
Cat. No M32-881/1982E - 569 p
Canada $28.00; other countries $33.60

This monograph provides new instrumental methods based on techniques such as light-absorption spectrophotometry, polarography, potentiometry, fluorimetry, flame-emission and atomic-absorption spectrophotometry. These methods were developed at CANMET for use in product analysis in metallurgical and other experimental research. It is intended as a manual and reference for chemists and technical staff in government, industry and other organizations.

002 CANMET Report 80-4E. Gransden, J.F., Price, J.T. and Leeder, W.R. "Cokemaking with Canadian medium- and high-volatile commercial coking coals"
Cat. No. M38-13/80-4E - 29 p
Canada $2.25; other countries $2.70

The quality of coke obtained from Western coking coals and from blends of Western and Eastern Canadian coking coals was investigated. Blending low ash, high sulphur Eastern coals with high ash, low sulphur Western coals produced cokes with chemical and physical properties suitable for the blast furnace. Measured stability factors were compared with those predicted from coal properties by three methods. The petrographic method gave accurate predictions of the strength of coals coked alone but was less accurate for blends of coals. The G-factor method was fairly accurate for all coals and blends except for Eastern Canadian coal. The third method was the most accurate and used a relationship between coke strength, mean maximum vitrinite reflectance and maximum Gieseler fluidity obtained by regression of CANMET data for 180 Western coals.

003 CANMET Report 80-20E. Kirk, B. "An iris diaphragm-based interface for use in eriometry"
Cat. No. M38-13/80-20E - 21 p
Canada $2.50; other countries $3.00

Eriometry, the estimation of the size distribution of a set of fineparticles from their group diffraction pattern, has shown considerable potential for industrial application. This report describes a new and inexpensive method for interfacing the eriometer to a mini-processor. When the eriometric analysis was applied to fineparticles of silica whose size range was adequately covered by the system, the results were in good agreement with those from microscopic analysis.

004 CANMET Report 80-27E. Knight, G. "Generation and control of mine airborne dust"
Cat. No M38-13/80-27E - 20 p
Canada $2.10; other countries $2.50

A study was undertaken to determine the sources of airborne dust in mines and to investigate control methods. Dust measurements from six mines are given for blasting, rock loading, transport and hauling, drilling, and ancillary operations. Results show that blasting, crushing and vertical orepasses produced the most dust. Recommendations for dust control in hard rock mines are given.

005 CANMET Report 81-1E. Steger, H.F. and Bowman, W.S. "Niobium ore OKA-1 - A certified reference material"
Cat. No. M38-13/81-1E - 14 p
Canada $1.75; other countries $2.10

A niobium ore, BL-5, was prepared as a compositional reference material. In a "free-choice" round-robin analytical program 22 laboratories contributed results; a statistical analysis of the data gave a recommended value of 0.37 ± 0.01%.

006 CANMET Report 81-2E. Hamer, C.A. "Acid extraction of alumina from Canadian non-bauxite sources at CANMET"
Cat. No. M38-13/81-2E - 14 p
Canada $2.00; other countries $2.40

CANMET'S laboratory work on acid extraction processes for recovering alumina from Canadian non-bauxite sources is reviewed. The materials investigated were anorthosite, clays and coal waste. Hydrochloric acid techniques and the H Plus process were used as they are considered the most advanced technologies for alumina recovery. Although the work was on a laboratory scale, it was shown that aluminum could be extracted from domestic anorthosite, clays, and fluidized-bed ash and that alumina of cell-grade quality could be recovered. Preliminary costing indicated that all processes are slightly more expensive in both capital and operating costs than the Bayer process using bauxite.

007 CANMET Report 81-3E. Mikhail, M.W, Bird, L.C. and Landgren, N.I.T. "Feasibility study on recovery of thermal coal from waste dumps in Nova Scotia"
Cat. No. M38-13/81-3E - 29 p
Canada $3.75; other countries $4.50

A program was initiated in 1972 to recover saleable coal from mine waste dumps adjacent to the existing Acadia wash plant in Stellarton, N.S. By the end of 1979 a total of 738 202 t of dump material had been processed and a total of 205 212 t of thermal coal produced for power generation and domestic use in Nova Scotia. This paper briefly reviews the existing Stellarton wash plant facility and presents an evaluation of the washability characteristics of the Westville waste dump material in relation to the bulk text. Plant design options for recovery of thermal coal from the Westville dumps are presented with the possibility of extending the program to other coal waste dumps in Nova Scotia.

008 CANMET Report 81-4E. Hardin, A.H., Ternan, M. and Packwood, R.H. "The effects of pore size in MoO_3-CoO-Al_2O_3 hydrocracking catalysts"
Cat. No M38-13/81-4E - 36 p
Canada $3.75; other countries $4.50

Effects of variations in mean pore diameter in four series of catalysts were determined for hydrodesulphurization, hydrodenitrogenation and conversion reactions of Athabasca bitumen. Standard tests were made on a blank alumina support and three cobalt/molybdenum/alumina catalyst series having the compositions 1.1:2.2, 4.4:8.8 and 3.0:15.0 m % CoO:MoO_3, respectively. Median pore diameter distributions, determined by Hg penetration, had values between 7.0 and 100.0 nm. Pore volumes varied between 0.25 and 0.65 $mL g^{-1}$. Surface areas, varied from 1 to 200 $m^2 g^{-1}$. Electron microprobe analyses indicated distinct variations in the radial distributions of Fe, Ni, V and S across the catalysts. Results indicated maxima for mass per cent sulphur removal for pores near 15 nm for two catalysts. Also, the rates per unit area for S and N removal increased as mean pore diameters increased to about 50 nm, after which the rates appeared to be constant.

009 CANMET Report 81-5E. Beshai, J.E. and George, A.E. "High performance liquid chromatographic HPLC method for type analysis of hydrocarbons in synthetic fuel naphtha"
Cat. No. M38-13/81-5E - 6 p
Canada $1.50; other countries $1.80

A method is described for determining the olefin, saturate and aromatic contents in synthetic fuel naphtha using an HPLC system developed in CANMET's Synthetic Fuels Research Laboratory. It takes about 20 min per analysis and meets four basic requirements: rapid determination; reproducible results; minimum exposure of samples to heat, air and light to avoid chemical change; and separated hydrocarbon class concentrates are unaltered chemically. A model hydrocarbon mixture and three synthetic fuel naphtha fractions were analyzed and results compared with FIA analyses.

010 CANMET Report 81-7E. Steger, H.F. and Bowman, W.S. "PD-1: A certified non-ferrous reference dust"
Cat. No. M38-13/81-7E - 17 p
Canada $2.00; other countries $2.40

A 165-kg sample of non-ferrous dust, PD-1, from the zinc-copper smelter of Hudson Bay Mining and Smelting Company Limited, Flin Flon, Manitoba, was prepared as a compositional reference material. PD-1 was ground to minus 74 μm, blended in one lot and tested for homogeneity by chemical methods both before and after bottling in 200-g units. In a free-choice analytical program, 26 laboratories contributed results for one or more of lead, arsenic and mercury in one bottle of PD-1. The following recommended values were assigned: Pb, 2.75%; As, 0.77%; and Hg, 389 μg/g.

011 CANMET Report 81-8E. Jambor, J.L. "Mineralogy of the Caribou massive sulphide deposit"
Cat. No. M38-13/81-8E - 65 p
Canada $4.75; other countries $5.70

Results are given of an investigation into the distribution and mineral sources of silver in the Caribou massive sulphide deposit in northern New Brunswick. Results of a more comprehensive study of the ore are also presented to provide basic documentation of the types of minerals and textural features that are characteristic of the Caribou massive sulphides.

012 CANMET Report 81-9E. Collings, R.K. "Mineral waste resources of Canada Report No. 5 - Mining wastes in the Prairie Provinces"
Cat. No. M38-13/81-9E - 21 p
Canada $2.50; other countries $3.00

This report provides background information on waste rock and mill tailings in the Prairie Provinces where more than 90 x 10^6 t of such wastes are produced annually. Data on the occurrence, mineralogy, petrography, and physical and chemical characteristics of wastes from 21 operating mines are provided for four principal types of mines - metal, uranium, non-metallic or industrial mineral, and coal. Potential uses are noted along with relevant research.

013 CANMET Report 81-10E. "CANMET Review 1980-81"
Cat. No. M38-13/81-10E - 62 p
Canada $5.00; other countries $6.00

The federal Department of Energy, Mines and Resources aims to ensure the effective use of Canada's energy and mineral resources by determining the country's natural resource potential, improving resource technology, evaluating economic and social factors, formulating and implementing policy, and transferring new technology to governments, industry and the public. Contributions by the Canada Centre for Mineral and Energy Technology (CANMET) to the above objectives are described.

014 CANMET Report 81-11E. Steger, H.F., Bowman, W.S. and Zechanowitsch, G. "DH-1a: A certified uranium-thorium reference ore"
Cat. No. M38-13/81-11E - 14 p
Canada $2.00; other countries $2.40

A 122-kg sample of a uranium-thorium ore, DH-1a, from Elliot Lake, Ontario, was prepared as a compositional reference material to replace the similar certified ore, DH-1, of which the stock had been exhausted. DH-1a was ground to minus 74 um, blended in one lot and bottled in 200-g units. The homogeneity of DH-1a with respect to uranium was confirmed in CANMET using the volumetric-umpire method. The recommended value for uranium is based on the data from the confirmation of homogeneity. For thorium, 12 laboratories provided results in a free-choice analytical program. A statistical analysis of the data gave a recommended value of 0.263% for uranium and 0.091% for thorium.

015 CANMET Report 81-13E. Steger, H.F. and Bowman, W.S. "MA-2: A certified gold reference ore"
Cat. No M38-13/81-13 - 13 p
Canada $2.50; other countries $3.00

A gold ore, MA-2, from Kirkland Lake, Ontario, was prepared as a compositional reference material. In a free-choice analytical program 22 laboratories contributed results; a statistical analysis of the data gave a recommended value of 1.86 µg/g.

016 CANMET Report 81-15E. Wilson, H.S. "Lightweight aggregates - vermiculite, perlite, pumice - for insulating concretes"
Cat. No. M38-13/81-15E - 28 p
Canada $3.50; other countries $4.20

This report deals with lightweight aggregates that are produced from vermiculite, perlite and pumice and used in non-load-bearing and insulating concretes and plastics. A discussion is presented on their mineralogy and geology, distribution of the world's deposits, mining and processing, and their properties and applications, both for construction and other purposes. Specifications pertaining to concrete plaster and other structural applications are also described.

017 CANMET Report 81-16. Metz, J.L. "Catalogue of CANMET publications 1980-81"
Cat. No. M38-13/81-16 - 43 p
Canada $5.00; other countries $6.00

A comprehensive listing is provided of reports prepared by CANMET research and professional staff during and in some cases before 1980/81. Also included are research reports prepared by outside agencies under contract.

018 CANMET Report 81-17E. Collings, R.K. and Wang, S.S.B. "Mineral waste resources of Canada Report No. 8 - Non-ferrous metallurgical wastes"
Cat. No. M38-13/81-17E - 11 p
Canada $2.25; other countries $2.70

Canadian mining, mineral processing, metallurgical and chemical process industries generate about 700 x 10^6t/a of solid mineral and mineral-based wastes of which 4 x 10^6 is from non-ferrous operations. This report provides technical data on non-ferrous metallurgical wastes according to type, amount produced, physical characteristics, chemical analyses. Current and potential uses for copper, nickel and lead slags are provided.

019 CANMET Report 82-2E. Wilson, M.F. "Impact of excessive aromatics in oil sand syncrudes on production and quality of middle distillate fuels"
Cat. No. M38-13/82-2E - 25 p
Canada $2.75; other countries $3.30

Increased production from oil sands and heavy crude deposits is expected in Canada during the next two decades. Current processes for upgrading Athabasca bitumen produce synthetic crudes of such high aromatics content that diesel and jet fuels produced from oil sand distillates do not meet current specifications. It is expected that the increasing demand for these fuels will exert pressure on existing refineries and threaten the qualilty of future fuel products. This report examines the consequences of these developments and discusses possible solutions.

SECTION 2

JOURNAL PUBLICATIONS

Papers are available only from the journal or proceedings cited, or by direct request to the author.

MINERAL SCIENCES LABORATORIES

020 Ahmed, S.M. "Surface chemistry of chrysotile asbestos"; Proc Symp "Asbestos from aqueous solutions"; ACS, Plenum Press; 213-226; 1981.

A chrysotile-aqueous solution interface was examined by measuring the zpc, the surface charge densities and the zeta potential, by means of potentiometric-pH titrations and electrophoresis. Results show that silicate ions are easily adsorbed on chrysotile shifting the zpc to a lower pH; they also act as anionic activators for the adsorption of long-chain cationic amines. Silicate ions can also protect the surface from acid damages in slightly acid solutions.

021 Berry, E.E. "Preparation and properties of sulphur-infiltrated autoclaved concrete"; Cement and Concrete Research 9:667-676; 1979.

Autoclaved concrete specimens were infiltrated with liquid sulphur at 150°C. The rates of sulphur infiltration, the mechanical properties and the durability of the infiltrated specimens were all found to be greatly influenced by the nature of the porosity of the uninfiltrated parent concretes. The size distributions of pores in the specimens were found to be controlled by the CaO/SiO_2 (mole) ratio of the binder.

022 Berry, E.E. "Strength development of some blended-cement mortars"; Cement and Concrete Research 10:1-11; 1980.

Development of compressive strength of mortars made from blends of slag, fly ash and Portland cement was examined. No apparent interactions were found between granulated slag and fly ash used together. An examination of the effects of supplementary cementing materials on entrapped air showed that one of the fly ash samples caused significant air reduction in the non-air-entrained fresh mortars. A modification of Feret's equation was applied to estimate the contribution made by this fly ash to cementing activity at early ages.

023 Berry, E.E. and Malhotra, V.M. "Reply to discussions of a paper by E.E. Berry and V.M. Malhotra - Fly ash for use in concrete - A critical review"; ACI J Disc. 77-8, p. 59; 1980.

Discussions of the above paper are presented.

024 Cabri, L.J., Laflamme, J.H.G. and Harris, D.C. "Mineralogical study of complex Pt-Fe nuggets"; Bull Soc Mineral Crystallogr 104: 508-525; 1981.

Goethite-coated eluvial and fresh-looking alluvial Pt-Fe nuggets from Joubdo stream, Birbir River are very variable in external morphology from rounded, flattened to very irregular with sharp projections. Scanning electron microscopy has revealed crystalline details of the Pt-Fe alloys at magnifications not reported previously. Also, other unnamed minerals are reported for the first time.

025 Chen, T.T. and Szymanski, J.T. "The structure and chemistry of galkhaite, a mercury sulfosalt containing Cs and Tl"; Can Mineral 19:571-581; 1981.

An electron microprobe analysis of 47 crystals of galkhaite from the Getchell mine, Humboldt County, Nevada, shows that Cs exceeds Tl in nearly all the crystals. There is a linear antipathetic relationship between the Cs and Tl contents of this sulfosalt; the slope of the relative proportion Cs:Tl is about 3:2.

026 Dutrizac, J.E. "Jarosite formation in chloride media"; Proc Australas Inst Min Metall 278:23-32; June 1981.

Factors affecting the formation of both sodium jarosite and sodium-lead jarosite in chloride solutions similar in composition to those likely to be utilized for the ferric chloride leaching of galena concentrates have been ascertained. Limited mass balance data for sulphate precipitation from chloride solutions are presented and the degree of co-precipitation of some common divalent metals has also been determined.

027 Donaldson, Elsie M. "Determination of aluminum in iron, steel and ferrous and non-ferrous alloys by atomic-absorption spectrophotometry after a mercury cathode separation and lextration of the aluminum acetylacetone complex"; Talanta 28:461-467; 1981.

This paper describes a method for determining total aluminum or both acid-soluble and acid-insoluble aluminum in mild and high-alloy steels and in ferrovanadium. Total aluminum can also be determined in copper- and nickel-base alloys. Results are compared with those obtained previously by the spectrophotometric pyrocatechol violet method.

028 Donaldson, Elsie M. "Spectrophotometric determination of boron in iron and steel with curcumin after separation by 2-ethyl-1,3-hexanediol-chloroform extraction"; Talanta 28:825-831; 1981.

A simple and reliable method for determining ~0.0001% or more of total boron in iron and low- and high-alloy steels is described. Acid-soluble and acid-insoluble boron can also be determined. Common ions, including large amounts of manganese, chromium, vanadium, titanium, molybdenum, tungsten, niobium and tantalum do not interfere.

029 Dutrizac, J.E. "The dissolution of chalcopyrite in ferric sulphate and ferric chloride media"; Trans Am Soc Metals 12B: 371-378; 1981.

The literature on the ferric ion leaching of chalcopyrite was surveyed to identify leaching parameters which are well established and to outline areas requiring additional study. Doubtful areas were carefully re-examined experimentally. Results and discussion of recent literature data are presented.

030 Dutrizac, J.E. and Chen, T.T. "The synthesis of mercury jarosite and the mercury concentration in jarosite-family minerals"; Can Mineral 19:559-569; 1981.

Factors affecting the composition and yield of mercury jarosite during synthesis by the preferred slow-addition technique have been studied. For a given rate of mercury addition, the product yield increased directly with increasing temperature or ferric ion concentration, but the mercury content of the product is nearly independent of either variable. The partition coefficients for mercury distribution between the solution and jarosite phase have been determined in both the Hg-K and Hg-Na systems. Dilute solutions of mercury in the Hg-Na system are nearly ideal, but potassium is preferentially precipitated in the Hg-K system. Several jarosite-family minerals were analyzed for mercury: none contains more than 0.08 wt % Hg.

031 Dutrizac, J.E. "The founding of the Canadian zinc industry"; Can Inst Min Metall Bull 15:1533-1539; 1980.

This paper discusses the early attempts to produce metallic zinc in Canada and notes the emergence of the Consolidated Mining and Smelting Company Ltd. (now Cominco Ltd.) as a dominant zinc producer in Canada.

032 Keyser, J. Hode and Malhotra, V.M. "Assurance of quality of concrete in North America - 1980-2000"; presented 6th ERMCO Congr, Brussels, Sept. 22-26, 1980. (Will be published in conf proc.)

This paper discusses various aspects of a quality assurance program starting with the specifications and concluding with the in-situ testing of concrete which, it is believed, will be well accepted by the concrete industry in North America by the year 2000.

033 MacKinnon, D.J. and Brannen, J.M. "Evaluation of organic additives as levelling agent for zinc electrowinning from choride electrolytes"; J Appl Electrochem 12:21-31; 1982.

The effects of various organic additives: Pearl glue, Separan NP10, Percol 140 and tetraalkylammonium chlorides, on zinc deposit morphology and orientation and on the current efficiency and energy requirement for zinc electrowinning from chloride electrolyte have been determined and compared.

034 Malhotra, V.M "Accelerated strength testing: Is it a solution to a contractor's dilemma?"; presented ACI meet, Las Vegas, March 7, 1980 and in Concr Int: Design and Construction 3:11:17-21; Nov. 1981.

This paper outlines the need for accelerated strength testing as a quality control tool in the construction industry. It describes the currently available testing methods and also discusses their use on large construction projects in North America.

035 Malhotra, V.M. and Carette, G.G. Reply to a discussion by Luke M. Snell and Robert B. Rutledge of a paper entitled: "Comparison of pullout strength of concrete with compressive strength of cylinders and cores, pulse velocity and rebound number"; Am Concr Inst J 152-155; March-April 1981.

036 Malhotra, V.M. "Rebound, penetration resistance and pulse velocity tests for in situ testing"; Concrete Construction 571-575; July 1981.

Several nondestructive testing methods are described for estimating the strength of concrete in place for early form removal or for investigating the strength of concrete in place because of low cylinder test results.

037 Malhotra, V.M., Carette, G.G. and Bremner, T.W. "Durability of concrete in marine environment containing granulated blast furnace slag, fly ash or both"; Am Concr Inst Special Publication 65:157-168; 1980.

CANMET research to determine durability of Portland cement/granulated blast furnace slag/fly ash concretes in marine environments is described.

038 Petruk, W. and Schnarr, J.R. "An evaluation of the recovery of free and unliberated mineral grains, metals and trace elements in the concentrator of Brunswick Mining and Smelting Corp. Ltd."; Can Min Metall Bull 74:833:132-159; 1981.

The behaviour of minerals during flotation of a fine-grained pyrite-rich base metal ore was investigated by studying the feeds, concentrate and tailings from every flotation cell in the mill of Brunswick Mining and Smelting Corp. Ltd., Bathurst, New Brunswick. The samples were analyzed for Zn, Pb, Cu, Fe, Ag, Sb, Sn, Bi, In, Hg, Mo and As. Results show that the behaviour of minerals is defined much better by the recovery of free mineral grains than by the recovery of elements.

039 Quon, D.H.H. and Wang, S.S. "Viscosity-temperature relationship of materials used for the experimental production of mineral wool"; J Can Ceram Soc 50:17-22; 1981.

A high-temperature viscometer was constructed and evaluated by measuring the viscosities of melts formulated from materials used in the experimental production of mineral wool at temperatures from 1300 to 1630°C. Eight samples of slag and quartz, trap rock and limestone, and nepheline syenite waste and limestone mixtures were prepared. Results show that viscosity is very sensitive to composition variation. The change in viscosity can be interpreted in terms of the probable structure change resulting from either polymerization or depolymerization of the structure network.

040 Steger, H. "Ore and metal standards vital to labs"; GEOS 10:3:13-15; 1981.

A certified reference material (CRM) is accompanied by or traceable to a certification document stating the element concentrations. This paper outlines CANMET'S contribution, through its Canadian Certified Reference Materials Project (CCRMP) in providing compositional RMs of Canadian origin.

041 Steger, H. "The new certification procedure of the Canadian Certified Reference Materials Project"; Geostandards Newsletter 2:189-193; Oct. 1981.

The Canadian Certified Reference Materials Project has amended its procedure in interlaboratory certification programs. The reasons for reducing to one from two the number of bottles of a candidate reference material submitted to each participating laboratory are discussed. The effect of the smaller number of results of the one-bottle approach to be expected on the certified value and 95% confidence interval is shown to be minor.

ENERGY RESEARCH LABORATORIES

042 Brown, J.R., Fyfe, W.S. and Bancroft, G.M. "Semi-quantitative surface analysis of Mt. St. Helen's ash by X-ray photoelectron spectroscopy (XPS)"; Appl Surf Sci 7:419-424; 1981.

A sample of Mt. St. Helen's tephra and USGS andesite rock standard (AGV-1) were analyzed by X-ray photoelectron spectroscopy (XPS). The results indicate major element surface analysis on powdered multicomponent samples (such as geological specimens) can be performed semi-quantitatively using an equation that relates XPS are in good agreement with atomic surface density. The surface compositions found by XPS are in good agreement with bulk X-ray fluorescence analysis (XRF). It is interesting to note that XPS analysis of this volcanic ash did not reveal a surface enrichment of chlorine or sulphur and only trace fluorine although these volatile elements are normally abundant in volcanic gases.

043 Brown, J.R., Fyfe, W.S., Murray, F. and Kronberg, B.I. "Immobilization of U-Th-Ra in mine wastes"; Can Min J 102:71-76; 1981.

By treating typical Elliot Lake uranium mine effluents with calcite, potassium phosphate solutions (300 ppm), with or without glacial tills, radium leach levels have been reduced to below 0.1 pCi/L. Such radium values are in the range of ocean waters and high quality fresh waters. Mine tailing permeabilities can be reduced to low levels by use of appropriate clay additives and in particular by the use of thin bentonite layers before closure.

044 Fung, D.P.C. "The CANMET coal gasification program"; Chemistry in Canada 32(6):25; 1981.

The status of CANMET'S coal gasification program is discribed. Experimental facilities for in-house research include a laboratory fixed-bed gasifier and a high pressure thermobalance reactor. The chemical reactivity of various Canadian coals in a gasification reaction is being assessed.

045 Furimsky, E. "Characterization of deposits formed on catalyst surface during hydrotreatment of coal-derived liquids"; Fuel Process Tech 6:1-8; 1982.

Loss of catalyst activity is attributed to the formation of polynuclear aromatic structures on the surface. Heavy species containing N and O heteroatoms were also present in deposits. Phenols, aromatic and heterocyclic compounds are considered to be the precursors for the formation of the deposits.

046 Ozubko, R.S., Clugston, D.M. and Furimsky, E. "Comparison of mass spectrometry and nuclear magnetic resonance spectrometry for determination of hydrocarbon type"; Anal Chem 53:183; 1981.

Three different petroleum fractions were analyzed by using mass spectrometric (MS), nuclear magnetic resonnance (NMR), and fluorescent indicator analysis (FIA) techniques. Results are given for these samples as well as the assumptions involved in, and limitations of, each technique.

047 Poirier, M.A. and George, A.E. "Separation and characterization of coal-derived liquids"; Energy Sources 5:339-359; 1981.

Methods of separation and characterization of coal-derived liquids devloped in the last ten years are reviewed. A reference guide for separating and characterizing specific constituents is also included.

048 Poirier, M.A. and George, A.E. "Selective separation and identification of olefins in petroleum and synthetic fuel naphtha"; Fuel 61:182-184; 1982.

An effective analytical procedure for the selective separation and identification of olefins in petroleum and synthetic fuel naphtha is described. The procedure was applied to two synthetic fuel naphthas produced by thermal and catalytic processing of the Lloydminister heavy oil. Results indicate that the olefins are produced during processing. The olefins of the catalytic naphtha are of predominantly higher average molecular weight than the thermal naphtha. Chemical configurations were assigned for 24 different olefins in both products.

049 Whaley, H. and Lee, G.K. "The behaviour of buoyant plumes in neutral and stable conditions in Canada"; Air Pollution Control Assoc., Paper 81-66P1, Philadelphia, PA; June 1981.

Plume dispersion parameters obtained from five geographic regions of Canada were evaluated and compared with standard predictive relationships established by Briggs and Pasquill-Gifford. The data correspond to neutral and stable conditions, stability class C to F but excludes any limited-mixing or layered asmosphere studies or situations where topography influences plume spread.

PHYSICAL METALLURGY RESEARCH LABORATORIES

050 Biefer, G.J. "Arctic corrosion"; GEOS 11:1:18; Winter 1982.

Results are given of a comparative investigation into corrosion rates of mild steel wire installed at various northern isolated Arctic posts and at various southern Canadian sites. Steel corrosion rates were shown to decrease from south to north and east to west. Higher rates in the Arctic were almost always close to the sea.

051 Brigham, R.J. "Technical note: On the variability of crevice corrosion initiation in ferric chloride exposure tests"; Corr 37:10:608; 1981.

This paper describes an investigation undertaken to explain the ±5°C scatter band which has characterized crevice corrosion of austenitic stainless steels. The relative severity of several substances including elastic bands as crevice materials was also evaluated.

052 Couture, A. "Literature survey on the properties of cast Ni-Al and Mn-Ni-Al bronzes"; AFS Int Cast Metals J 6:2:33-46; 1981.

The properties of low-and high-manganese aluminum bronzes are compared under the ANSI/ASTM B148-78 designation as alloys C95800 and C95700, respectively. Their mechanical properties at various temperatures and section thicknesses are discussed as well as corrosion behaviour, physical properties, and welding and foundry characteristics.

053 Couture, A. "Iron in aluminum casting alloys - A literature survey"; AFS Int Cast Metals J 6:33-46; 1981.

There is no unanimity among the various sources consulted on the effect of iron on the mechanical properties of aluminum casting alloys; however, generally, iron is detrimental. Various methods are advocated to decrease the influence of iron present in excess of specified levels. Rapid cooling may do so, but, if this is neither sufficient nor feasible, neutralizers such as manganese may be used with consistently good results.

054 Crawley, A.F., Shehata, M.T., Pussegoda, N. Mitchell, C.M. and Tyson W.R. "Batch-annealed dual phase steels"; Fundamentals of Dual Phase Steels 181-197; Chicago, Ill.; Feb. 23-24, 1981.

An overview is presented of a laboratory investigation into developing C-Mn dual phase steels by intercritical annealing in a batch process which would meet the following specifications: yield strengths (0.2% offset - 380 MPa), (3.0% offset - 480 MPa); ultimate tensile strength - 620 MPa; total elongation in 25.4 mm - 27%. Tensile properties and microstructures of a range of C-Mn steels are described as well as the experimental approach and preliminary results on modelling.

055 Davis, K.G. and Magny, J.G. "Cast-in-place hardfacing"; presented AFS Congr, Cincinnati, Ohio; Sept. 1981.

A procedure is described for cast-in-place hardfacing of castings in which metal is poured into a sand mould and is drawn by vacuum into a layer of abrasion-resistant powder (or grain) placed on a wall of the mould cavity. The infiltrated powder provides a metallurgically-bonded, abrasion-resistant coating on the casting. Since surfacing and casting are combined into one operation considerable reductions in costs should result.

056 Dion, J.-L. "Copper tuyeres with integrally cast copper tubing; presented 20th Ann CIM Conf, Hamilton, Ont.; Aug. 26, 1981.

A study was made of the techniques to integrally cast copper tubes in copper tuyeres for use in blast furnaces in an effort to produce two-compartment tuyeres having improved water-cooling capacity. A test pattern corresponding to a vertical section of a two-compartment tuyere and a cast in place copper tube was used to investigate variables such as tube preparation, tube coolant, pouring temperature/rate and gating design. It was shown that pouring temperature, pouring rate and type of coolant have to be controlled to successfully produce a copper casting containing an integrally cast copper tube.

057 Knight, R.F., Tyson, W.R., Lavigne M.J., McGrath, J.T. and Boyd, J.D. "Materials for hydrogenation vessels"; Conf Proc Am Soc Metals 139-163; 1981.

The principal structures of an hydrogenation plant are large reactor vessels which contain the process stream at high hydrogen partial pressures and high temperatures. Because of the aggressive operating environment and the size of the vessels, procedures must conform to stringent standards. This report describes existing materials and fabrication procedures.

058 McGrath, J.T., Patchett, B.M., Tyson, W.R. and Knight, R.F. "Fabrication technology and material property requirements for heavy wall pressure vessels"; presented Conf on Quality Manufacturing in the 80's, Toronto, Ont.; Oct. 1981;

The joining of heavy section steels in the fabrication of large pressure vessels is reviewed. In-service properties of pressure vessel steels are discussed, with particular emphasis on 2.25Cr-1Mo base metal and stainless steel weld overlay. The results of a study of the effect of phosphorus and silicon on temper embrittlement of 2.25Cr-1Mo steel and the role of rare earth additions in reducing the susceptibility to temper embrittlement are presented. The presence of hydrogen in stainless steel overlay can lead to a loss in ductility depending on the amount of sigma phase and disbonding at the overlay/base metal interface.

059 Ng-Yelim, J. "The effects of microstructure on the tensile and impact properties of a 1.0 pct V, 0.2 pct C steel"; Can Metall Quart 20:4:429-438; 1981.

The effects of various heat treatments on the microstructure and mechanical properties of a 1% V, 0.2% C steel were investigated. The limitations of high austenitizing temperatures are examined and the heat treatment which led to good mechanical properties is discussed.

060 Packwood, R.H. and Brown, J.D. "A gaussian expression to describe $\phi(\rho z)$ curves for quantitative electron probe microanalysis"; X-ray Spectrom 10:3:138-145; 1981.

It is shown that the depth distribution of X-ray production in the electron microprobe can be accurately described by a gaussian modified at the sample surface by a transient. Proposed equations provide a firm theoretical and experimental basis for microprobe analysis.

061 Paley, Z., Ng-Yelim, J. and Martin, P. "A weldability testing procedure for premium rail steels with reference to V-N steels"; Welding J 60:1:7s-11s; 1981.

A procedure was developed in which simulated electroflash welds were made from various V-N experimental rail steels in a Gleeble apparatus using 10 x 75 mm (0.39 x 0.39 x 3.0 in.) samples. A fairly wide range of cooling rates produced pearlitic structures. The hardness distributions in the simulated weld part of the samples were almost uniform, showing that the V-N rail steels have good electroflash weldability. A procedure for determining electroflash welding parameters is presented, which was applied to the welding of Cr-Mo premium rails.

062 Revie, R.W. "An electrode design for dual measurement of potentials inside artificial pits and on polarized surfaces"; Electrochem Soc Fall Meet 81:2:423-424; Denver, Colorado; Oct. 1981.

An electrode was designed to measure simultaneously potentials on the surface and inside an artifical pit. Duel potential measurements were made for electrodes cathodically polarized in 0.012 N $NaHCO_3$ + 0.003 N Na_2CO_3, a solution relevant to pipeline corrosion conditions. The effect of previous corrosion to increase the potential difference subsequently measured between the electrode surface and the inside of the pit was evaluated.

063 Sahoo, M., Edwards, J.O., Beke, L.J. and Szanto, Z. "High integrity cupro-nickel castings for technology demonstration and sea-water service evaluation"; AFS Trans 89:645-652; 1981.

As a sequel to laboratory studies on the foundry technology of niobium-modified cupro-nickel alloys, a "ship's set" of eight individual castings was made in a commercial foundry. This paper describes the design of gating and risering systems, melting procedures for these castings, and the progressive changes in mould rigging which improved their quality.

064 St. John, D.H., Davis, K.G. and Magny, J.G. "Computer modelling and testing of metal flow in gating systems"; Can Metall Quart 359-368; July-Sept. 1981.

A finite element model originally written for floodwave problems has been adapted for calculating the free-surface flow of liquid metals through a gating system. The model has been refined to a point where good correlation between observed and computed flow patterns is obtained.

065 Vosikovsky, O. and Rivard, A. "The effect of hydrogen sulphide in crude oil on fatique-crack growth in a pipeline steel"; Corr J 38:1:19-22; 1982.

Results are given from a study on X65 pipeline steel, submerged in crude oil containing hydrogen sulphide in concentrations from 30 ppm to saturation. The study provides data needed to estimate the corrosion fatigue life of flawed structures operating in "sour" crude oil. Results show that crack growth rate in crude oil is a function of hydrogen sulphide content.

066 Vosikovsky, O. and Rivard, A. "Growth of surface fatique crack in a steel plate"; Int J Fatigue 3:3:111-115; July 1981.

The growth rates of fatigue cracks were measured both on the surface and within the plate of X65 pipeline steel using the finite-element solution by Raju and Newman. Results show good agreement with those measured on single-edge notched specimens. The variation in shape of a growing surface fatigue crack is analysed and compared with other published measurements and analytical predictions by Nair.

067 Warda, R.D., Darke, E.F. and Guindon, H.P. "The true thermal efficiencies of 30 cupolas"; AFS Trans 89:719-730; 1981.

Comprehensive in-plant tests were conducted at 30 foundries to determine cupola melting efficiencies and operating practices. The distribution of input heat energy between the various outputs - metal, slag, stack gas, and shell and other losses was determined for each cupola. Coke costs were determined both in terms of hot metal at the cupola spout and shipped castings. Numerous opportunities for coke savings were identified and their potential impact quantified. Examples are presented to show how certain foundries have changed cupola design and practices to improve melting performance and reduce melting costs.

MINING RESEARCH LABORATORIES

068 Bigu, J. "The loss of radioactive decay products of radon and thoron in underground uranium mine environments"; CIM Bull 74:832:83; Aug. 1981.

Experimental data on particle deposition on walls are discussed and applied to underground uranium mine environments. Although the calculations are mainly of qualitative value, lack of more adequate documentation indicates that loss of radioactive particles, e.g., radon and thoron decay products, to walls in underground uranium mines is important and should be considered when calculating their concentration in mine atmospheres.

069 Bigu, J. "On the effect of a negative ion-generator and a mixing fan on the plate-out of radon decay products in a radon box"; Health Phys; 1981.

Studies were made on the effect of a negative ion-generator and a mixing fan on the radon daughter Working Level (WL) produced in an environmental radon box. A dramatic decrease in the WL was observed when either the ion-generator or the mixing fan was operating. The combined effect of the ion-generator and the mixing fan was substantially larger than that from either alone. Experiments at relative humidity from (45 to 95%) and at $20^{o}C \pm 3^{o}C$ were conducted whereby effects observed were nearly independent of relative humidity in the box.

070 Feng, K.K. and Hanasaki, K. "A numerical study of the behaviour of liquid and slurry explosives under projectile impact"; Propell Explos 6:74-87; Aug. 1981.

The basic processes in the projectile impact of liquid or slurry explosives containing gas bubbles were investigated numerically using a two-dimensional unsteady state model. The partial differential equations derived from the laws of conservation of mass and momentum, together with the equation of state proposed by Tait were solved by a finite difference TENSOR computer code.

TECHNOLOGY INFORMATION DIVISION

071 Dixon, C. "Steel with less energy"; GEOS 10:4:20-21; Fall 1981.

A method developed by CANMET for producing small section steel products by horizontal casting is described. This method is less expensive and less energy intensive than the current ingot casting method. It was shown that it could be profitable for manufacturers of tools, automobiles and machinery by allowing them to recycle their own metal scrap.

SECTION 3

ORAL PRESENTATIONS

The following papers were presented at various meetings, conferences, and symposia. As indicated some have been published in the appropriate conference proceedings or as journal articles. They are available only from the journal or proceedings cited, or by direct request to the author.

MINERAL SCIENCES LABORATORIES

072 Ahmed, S.M. "Photoelectrochemical cells for solar energy conversion"; ERP/MSL 82-11(OP); presented CANMET MSL Seminar Series, Ottawa, Ont.; Feb. 9, 1982.

Solar energy represents an inexhaustible source of clean and possibly cheap energy which can be converted into either electricity or a chemical fuel such as hydrogen by direct photoelectrolysis of water. The photoelectrochemical (PEC) cells employing semiconductor-liquid junctions offer a possible alternative method of solar energy conversion to the well-known solid state photovoltaic solar cells using p-n and other forms of junctions. The advantages are: (1) ease of formation of the semiconductor liquid junctions, (2) less stringent purity requirements, and (3) possibility of energy storage and conversion into chemical forms of energy, such as hydrogen, by direct photoelectrolysis of water.

073 Ahmed, S.M. "Studies of the interfacial effects in the photoelectrochemistry of semiconductors"; ERP/MSL 81-119(OPJ); presented Electrochem Soc Conf, Denver, Col.; Oct. 11-16, 1981.

Information is provided on the nature of semiconductor-solution equilibria in the absence of any added redox couple, the origin of surface charge and potential in the reversible double layer (aqueous), the distribution of potential at the interface, and the effects of these parameters on the photoelectrochemical behaviour of semiconductors.

074 Cabri, L.J. "Mineralogy and distribution of the platinum-group in mill samples from the Cu-Ni deposits of the Sudbury, Ontario area"; MRP/MSL 80-711(OPJ); presented 4th Int Precious Metals Inst Conf, Toronto; June 1980 and in Proc.

Detailed mineralogical studies have shown that the platinum-group element (PGE) mineralogy is variable between deposits but, for the Sudbury area as a whole, the principal platinum-group minerals (PGM) are: michenerite, sperrylite and moncheite. Less common are insizwaite, froodite, sudburyite, kotulskite, merenskyite, niggliite, mertieite II, hollingworthite, irarsite, and three unnamed minerals. In situ analyses have also established that Pd, Pt and Rh occur as dilute solid solutions (50-1040 ppm) in sulpharsenides (cobaltite and gersdorffite). The presence of PGE as more dilute solid solutions in the common sulphides can only be determined by indirect methods. It is proposed to demonstrate how a mineralogical database, for mill samples ranging from a few tens to a few hundred ppb PGE, may be used to determine metal balances during treatment of the Cu-Ni ores, and to indicate research areas to improve metal recoveries.

075 Campbell, M.C. "Uranium extraction in Canada - Status 1982"; ERP/MSL 82-19(OP); presented NEA/IAEA Working Group on Uranium Extraction Meet, Vienna; March 8-10, 1982.

Various technological developments in Canada's three uranium-producing areas - Elliot Lake, Bancroft and Saskatchewan - are outlined.

076 Campbell, M.C., Ritcey, G.M. and Joe, E.G. "Chloride metallurgy for uranium recovery: concept and costs"; ERP/MSL 81-126(OP); presented NEA Ore Processing/Tailings Conditioning Workshop, Fort Collings, Col.; Oct. 28-29 1981.

The concept of chloride metallurgy for uranium extraction is described. Results of investigations into this new concept show that it offers an alternative to conventional sulphuric acid leaching through which radium can be quantitatively solubilized.

077 Feng, K.K. "Desorption of gases from Canadian coals"; ERP/MRL 81-20(OPJ); presented 19th Int Conf on Safety in Mines Research, Katowice, Poland; Oct. 6-14, 1981. (Will be published in conf proc.)

Desorption of gases from borehole samples taken from coal seams in Nova Scotia, Alberta and British Columbia are reported and correlated by the Airey equation. The desorption as well as initial rate curves provide useful information for design of ventilation systems in underground mining. The correlation of gas content with depth from borehole samples taken from multiple seams in Elkford, B.C. indicates that at 200 m the gas content is only about one quarter of that at 400 m.

078 Leguitton, D. "Methodology transfer for the simulation of mineral and coal processing plants"; MRP/MSL 81-45(OP); presented CIM 83rd Ann Gen Meet, Calgary; May 3-6, 1981.

Mathematics, process theory, process practice and computer applications are the main disciplines that contribute to developing useful techniques for computer simulation of mineral and coal processing plants. The SPOC project at CANMET is devoted to computer simulation and as such has addressed or will address problems inherent to methodology transfer. The first major output of the project was the material balance program MATBAL 2 which has been acquired by over 20 organizations. CANMET'S experience in effecting methodology transfer through documentation, industrial workshops, and summer student programs is discussed and the future outlined.

079 Malhotra, V.M. "International conference on the performance of concrete in marine environment, August 1980 - A review"; presented 5th Int Symp on Concrete Technology, Caracas, Venezuela; Nov. 17-20, 1980.

In August 1980, a five-day International Conference on the Performance of Concrete in Marine Environment was held in Canada. A total of 33 papers from eleven countries were presented. This paper reviews the subjects covered and gives a complete listing of the papers presented.

080 Malhotra, V.M. "Evaluation of concrete by ultrasonic pulse velocity method"; MRP/MSL 81-113(OP); presented 6th Ann Conf on Concrete Technology, Caracas, Venezuela; Oct. 1981.

Principles of the ultrasonic pulse velocity method for evaluating concrete are outlined. Factors affecting the pulse velocity measurements and major areas of application are given. The limitations of this method in estimating the strength of concrete are emphasized. Inasmuch as a large number of variables affect the relations between the strength parameters of concrete and its pulse velocity, the use of the latter to predict the compressive flexural strengths of concrete is not recommended. Instead, serious considerations should be given to the use of pulse velocity as a control test in its own right, and perennial attempts to correlate pulse velocity with strength parameters should be discouraged.

081 Mirkovich, V.V. and Bell, K.E. "A novel method for predicting thermal shock resistance of brittle materials"; MRP/MSL 80-173(OPJ); presented Can Ceram Soc Ann Meet, Toronto; Feb. 1981 and in J Can Ceram Soc 50:29-33; 1981.

Previous work has shown a relationship between the thermal spalling behaviour of rocks and the product of thermal expansion and thermal diffusivity values. The work described extends this concept to thermal failure of a series of clay bodies. Good correlation is obtained between the predicated order of failure in thermal shock and actual failure determined by an empirical method.

082 Petruk, W., and Schnarr, J.R. "The behaviour of galena, chalcopyrite and tetrahedrite during flotation of a fine-grained base metal ore in the concentrator of Brunswick Mining and Smelting Limited"; MRP/MSL 81-7(OPJ); Am Inst Min Metall; Process Mineralogy 201-212; 1981.

The above three minerals were analyzed by image analysis to determine their grades and recoveries as related to free and unliberated mineral grains and their size distributions. Results show that only 37 wt % of the galena was liberated but 88 wt % of the free galena was recovered, indicating good mill performance for the lead. The lead recovery was 65 wt %, with the main loss due to unliberated galena. Most of the unliberated galena lost to mill tailings is so fine-grained that galena liberation and Pb recovery would not improve significantly by regrinding. Chalcopyrite liberation was 56 wt % but only 75 wt % of the free chalcopyrite was recovered. Copper recovery was 45 wt %, with the chalcopyrite loss in the mill tailings being both as large free grains, and as small and large unliberated grains. It was calculated that copper recoveries could be improved from about 8 to 10 wt % by changing the concentrator operations and by regrinding. About 29 wt % of the silver was lost to tailings mainly as both free and unliberated, large and very small, silver-bearing tetrahedrite grains. It was calculated that about 25 wt % of the silver might be recovered by improved milling conditions and regrinding.

083 Ritcey, G.M and Ashbrook, A.W. "Treatment of cobalt arsenide feeds for the subsequent recovery of cobalt"; MRP/MSL 80-172(OPJ); CIM Bull 74:834:103-112; 1981.

This paper summarizes the optimum leach conditions for each of several cobalt-containing arsenical feed materials, describes solution treatment prior to purification of cobalt recovery, and discusses plant operation on one feed as well as the treatment of effluents.

084 Silver, M. and Dinardo, O. "Factors affecting the oxidation of thiosalts by thiobacilli"; MRP/MSL 80-160(OPJ); presented Can Soc Microbiol Ann Meet, June 1981. (Will be published in Applied and Environ Microbiol.)

Results are given from a study on the effects of temperature, initial pH, and the concentrations of ammonium, phosphate and heavy metals on the oxidation of thiosalts by an authentic strain of Thiobacillus thiooxidans and by a mixed culture isolated from a base metal processing mill effluent pond.

085 Smith, C.W. "Determinations of radioactive isotopes by the Spectrochemistry Section, Chemical Laboratory"; ERP/MRP/MSL 81-147(OP); presented CANMET MSL Seminar Series, Ottawa, Ont.; Nov. 10, 1981.

The radiochemistry group of the Spectrochemistry Section provides radioactive isotope determinations in support of several major projects in both the "Minerals Technology" and "Energy Technology" activities of the CANMET Minerals and Earth Sciences Program. These projects deal with radioactive ore processing and related environmental problems, and require measurements of isotopes from the uranium and thorium decay series as present in a variety of matrices. An overview of the radioanalytical technology currently used and being developed by the group in meeting these requirements is presented, highlighting the applications of alpha-particle and gamma-ray spectrometries. Limitations imposed by various chemical and spectral interferences are discussed.

086 Wheat, T.A. "Solid electrolytes - their nature and applications"; ERP/MSL 81-42(OP); presented Mineral Sciences Laboratories colloquium, Ottawa; April 14, 1981.

A survey of the structural and dielectric characteristics of ionically conducting solids is given. The increasingly important applications for this group of materials are reviewed and the current ionics program both within CANMET and elsewhere is outlined.

087 Wheat, T.A., Hanson, A.J. and Starchuk, J.M. "An examination of the sodium-, potassium- and hydrogen-conducting forms of zirpsio ceramic"; ERP/MSL 81-16 (OP); presented Sem Fast-Ion Conductors, Queen's Univ; Feb. 2, 1981.

The production of single-phase, high-density zirpsio ceramic by hot pressing is described. Having an ionic conductivity of $2.10^{-1}(\text{olm.cm})^{-1}$ at 300°C, this material is comparable with the best of the sodium beta"-aluminas. The conversion of this material to the potassium- and hydrogen-conducting analogues is examined.

088 Wheat, T.A, Kuriakose, A.K. and Packwood, R.H. "The sodium zirpsios: their development and behaviour"; ERP/MSL 82-15(OP); presented Ann Conv, Can Ceram Soc; Feb. 28-March 2, 1982.

The chemical inhomogeneity, phase assemblage characteristics and reaction kinetics with water of a series of materials having the general composition $Na_{1+x}Zr_2Si_xP_{3-x}O_{12}$ Na-zirpsio) are discussed. It is concluded that a loss of Na and P can occur during sintering resulting in the precipitation of small amounts of monoclinic ZrO_2 and the formation of a glassy phase. Impurities such as Al_2O_3 tend to concentrate in the glass: both the time of sintering and the impurity content tend to increase the amount of glass formed. The materials react with water transferring part of the Na and phosphate into solution - the reaction rate increasing with increased SiO_2 content. A small amount of Al_2O_3 (~0.5 wt %) increases the reactivity of the zirpsios with water by a factor of nearly 10^4.

089 Wheat, T.A. and Starchuk, J.M. "Examination of compositional variations in Na-ZIRPSIO ceramics"; ERP/MSL 81-24(OPJ); presented Ann Meet, Can Ceram Soc, Feb. 22-24, 1981 and in J Can Ceram Soc.

The synthesis of essentially single-phase, high-density $Na_{1+x}Zr_2Si_xP_{3-x}O_{12}$ ceramics (X = 1.8 to 2.4) is described and typical microstructures are presented. Compositions with X in the range from 1.8 to 2.0 yield exceptionally fine-grained single-phase material having a monoclinic structure, whereas compositions having X in the range from 2.1 to 2.4 develop a larger grain size, have a low concentration of monoclinic zirconia as a second phase and exhibit rhombohedral symmetry.

090 Wilson, H.S. "The properties and applications of lightweight aggregates and concrete"; MRP/MSL 81-98(OP); presented 6th Ann Conf Concrete Technology, Caracas, Venezuela; Oct. 26, 1981.

The lightweight aggregates, which are produced from clay, shale, slate, fly ash, blast furnace slag, pumice, vermiculite and perlite, have densities from 30 to 900 kg/m^3. This report describes raw materials, methods of production, properties and the various applications, particularly in lightweight concretes. The concretes range from insulating concrete at 240 kg/m^3 to structural concrete at 1920 kg/m^3.

ENERGY RESEARCH LABORATORIES

091 Andersen, N.E. and Hamza, H.A. "The characterization of oxidized coal - a review"; ERP/ERL 81-32(OPJ); presented 64th Conf, Chem Inst Canada, Halifax; May 31-June 3, 1981 and in Proc.

Methods are summarized which have been used to detect or quantify the oxidation state of coal. Attention is focused on problems and limitations of data obtained. A bibliography of various methodologies is provided.

092 Brown, J.R., Kronberg, B.I. and Fyfe, W.S. "An ESCA examination of coal and coal ash surfaces"; ERP/ERL 81-33(OP); presented CIC Conf, Coal Symp, Halifax; June 3, 1981 and in Coal - Phoenix of the 80's, Chem Inst Canada 114-121; 1981.

Two coal samples from National Bureau of Standards and four from North America were examined using the direct, surface sensitive technique of X-ray photoelectron spectroscopy (ESCA). Results show that ESCA is useful in elucidating element siting within coal and coal ash and it may be possible to identify coal from different deposits. Application of ESCA in coal geochemistry is indicated.

093 Brown, T.D., Leeder, W.R., Price, J.T. and Gransden, J.F. "The role of CANMET in the research activities of the Canadian Carbonization Research Association"; ERP/ERL 80-59(OP); presented 19th Conf Metall, Can Inst Min Metall, Halifax; Aug. 24-28, 1980.

The Department of Energy, Mines and Resources as an associate member, provides the experimental facilities which are the focus of the Canadian Carbonization Research Association activities in cokemaking and resource evaluation. Objectives are to improve the quality of coke used in Canadian blast furnaces, improve the quality of cokes made from Canadian coal blends, and expand the range of coals suitable for cokemaking in Canada. Experimental programs using technical-scale coke ovens to investigate the effects of selective pulverization, partial briquetting and pitch additions are illustrated. These programs have demonstrated that these objectives can be achieved using coals available to the Canadian steel industry or coals produced by Canadian coal companies.

094 George, A.E. and Beshai, J.E. "Distribution of polynuclear aromatic ring classes in the Alberta basin bitumens and crude oils"; ERP/ERL 81-09(OP); presented Am Chem Soc Meet, New York; Aug. 1981.

The effects of simulated and natural geothermal maturation on the total content of polynuclear aromatic hydrocarbons (PAH) and their ring number distribution were studied. Response of the alkyl substitution on the PAH to maturation effects was also monitored. The treatment produced PAH ring distribution similar to that found in light Medicine River oil, and diminished PAH content considerably. The 3- and 4-fused ring systems increased while hydrocarbons containing more than four fused rings decreased. Alkyl substitution was also reduced as a result of both the natural and simulated maturations.

095 George, A.E., Beshai, J.E. and Smiley, G.T. "Effect of burial depth on the hydrocarbon-type distribution on the bitumens and oils from the Alberta basin"; ERP/ERL 81-57(OP); presented Am Chem Soc Meet, San Antonio, Texas; Dec. 9, 1981.

A systematic study of hydrocarbon formation and conversion under the effects of maturation, especially goethermal can improve the reliability of predictions associated with petroleum exploration. The thermal maturation of Athabasca bitumen was simulated and the chemical changes during reductive thermal treatments at increasing severities were monitored to show that the bitumen's chemical composition changes to resemble that of more Cretaceous oils.

096 Kelly, J.F. "The CANMET coal liquefaction contract program"; ERP/ERL 81-34(OP); presented 2nd World Congr of Chem Eng, Montreal; Oct. 4-9, 1981 and in Proc.

A brief overview of the CANMET coal liquefaction contract program is presented. Projected priority areas and directions are outlined. Results from program projects on the liquefaction behaviour of Alberta sub-bituminous coal in co-processing experiments with Athabasca bitumen and in supercritical gas extraction with toluene are presented.

097 Lee, G.K., Brown, T.D., Friedrich F.D. and Whaley, H. "Canadian low-rank coals: Resources, conversion and utilization"; ERP/ERL 81-46(OP); presented 11th Biennial Lignite Symp, San Antonio, Texas; June 14-16, 1981.

An overview is presented of the role of low-rank coal in Canada with respect to potential resources and reserves; present and future market demand; current research, development and demonstration projects, and future perspectives.

098 Lee, G.K., Friedrich, F.D., Steindl, S.L. and Whaley, H. "A pilot-scale combustion research facility for low-quality fuels"; ERP/ERL 81-52(OP); presented Engineering Foundation International Conference on Experimental Research into Fouling and Slagging Resulting from Impurities in Combustion Gases, Henniker, N.H.; July 12-17, 1981. (Will be published in conf proc.)

The Canadian Combustion Research Laboratory of CANMET recently designed a new pilot-scale facility to evaluate indigenous low-qualilty, ash-bearing fuels including coal from newly-opened deposits, coal slurries, biomass, petroleum coke, liquid refinery residues and bitumen/water emulsions. The rationale for constructing the research facility, key design considerations and a description of the combustion system are described.

099 Leeder, W.R., Gransden, J.F. and Price, J.T. "Cokemaking with Canadian coals"; ERP/ERL 81-42 (OPJ); presented 64th Conf, Chem Inst Can, Halifax; May 31-June 3, 1981.

This report discusses some of the findings of CANMET studies to assess Canadian coking coal quality and its use in newer cokemaking technologies. The use of Canadian coking coals in commercial types of coal blends was investigated and results were good. Canadian coking coals have excellent coking blend components and are satisfactory for new coking technologies.

100 Nandi, B.N., MacPhee, J.A., Ciavaglia, L.A., Chornet, E. and Arsenault, R. "Role of mesophase in upgrading inert-rich oxidized coals for combustion"; Proc 15th Carbon Conf, Univ of Pennsylvania, Pa.; June 22-26, 1981.

Highly oxidized inert-rich coals are difficult to burn efficiently and the presence of a high percentage of unburnt carbon in the combustion residue and fly ash makes their use undesirable. Liquefaction of coal and peat using carbon monoxide and water has been studied extensively. Using this approach a laboratory-scale (batch) process to improve the combustion efficiencies of this type of coal has been developed. This approach leads to observed increases in maximum dilatation, contraction, plasticity and initial mesophase development which correlate well with the restoration of the optimum propensity for efficient combustion.

101 Nandi, B.N., MacPhee, J.A., Ciavaglia, L.A., Chornet, E. and Arsenault, R. "Upgrading of inert-rich oxidized coal from Western Canada with reducing gases to improve combustion performance"; Proc 64th Can Chem Conf, Halifax; May 31-June 3, 1981.

The development of a laboratory-scale (batch) process to improve the combustion efficiencies of oxidized inert-rich coals by treatment with a reducing gas under certain conditions is discussed. Products obtained from this process confirmed the restoration of the optimum propensities for efficient combustion. The amount of unburnt carbon in the fly ash and residual product has been reduced from 20% to 0.5%.

102 Poirier, M.A. and George, A.E. "A rapid method for the determination of asphaltenes content in Western Canada bitumens using thin layer chromatography"; Proc 28th Congr Int Union of Pure and Appl Chem, Paper No. EP-23; Vancouver; Aug. 16-21, 1981.

A rapid method is presented for determining asphaltenes content in bitumens and processed bitumens using thin layer chromatography (TLC) and colorimetry. The method involves separating asphaltenes from maltenes on a TLC plate. The asphaltene bands are removed from the plate and extracted in toluene, and the concentration determined by colorimetry. It is applicable to all solid and semi-solid petroleum, to gas oils, to heavy oils and to crude petroleum that has been topped to 350°C or higher. The procedure has been applied to Athabasca, Lloydminster and Cold Lake bitumens and their processing products containing different amounts of asphaltenes. Asphaltenes content from 0% to 100% can be determined. Results are compared with the standard IP procedure.

103 Poirier, M.A. and George, A.E. "Olefin distribution in the naphtha products of processed Lloydminster oil"; Proc Pittsburgh Conf Analytical Chem and Appl Spectroscopy, Paper No. 047 Atlantic City, N.J.; March 9-13, 1981.

104 Price, J.T., Gransden, J.F. and Brown, T.D. "Canadian R & D studies of partially briquetted coke oven charges - addition of non-coking coal and additives"; ERP/ERL 81-60(OPJ); 17th Biennial Conf, Inst Briquet Agglom, Reno, Nevada; Aug. 31-Sept. 3, 1981.

Results are discussed from an investigation on partial briquetting which involves briquetting a coal or coal blend and uniformly mixing the briquets with loose coal or coal blend before dropping into the coke oven. It was shown that about 40 to 80% petroleum coke, thermal or semi-anthracite coals could be substituted into the briquets added to the charge before coke quality deteriorated compared with that of conventionally charged base blend.

105 Skubnik, M. and Whalley, B.J.P. "A consideration of coal slurry transportation for Canada"; ERP/ERL 81-12(OP); Proc 15th Biennial Conf of Int Cargo Handling Coord Assoc, Edmonton; June 7-12, 1981.

Slurry pipeline technology has been considered in Canada for transporting coal to the West Coast for export, to Ontario for power production and to Western Canadian oil fields for use in extraction and upgrading plants. Water, crude oil and methanol modes of coal pipelining are compared and their implications discussed in terms of availability, coal-liquid interaction, coal-liquid separation, and system economics.

106 Teodosiu, G., Arsenault, R., Bellemore, G., Chornet, E., Hodd, S.L. and Kelly, J.F. "Development of a testing facility for direct hydrogenation of Canadian low rank coals"; ERP/ERL 81-41(OP); presented 64th Conf, Chem Inst Can, Halifax; May 31-June 3, 1981 and in 2nd World Congr of Chem Eng Proc II:71; 1981.

Research and development leading to the construction of a 10 kg/h continuous flow testing facility for direct hydrogenation of Canadian low-rank coals is presented. A summary of the information obtained in the batch autoclave work using a Western Canadian lignite, comments on design, construction, operational range, and problem areas are discussed. Preliminary results and mass balance for a specific case are presented.

107 Whaley, H. and Lee, G.K. "Dispersion parameters measured during neutral and stable conditions in Canada"; ERP/ERL 81-22(OP); presented 74th Ann Meet, Air Poll Control Assoc, Philadelphia, Pa.; June 21-26, 1981.

Results are given from a study undertaken by the Canadian Combustion Research Laboratory to determine atmospheric dispersion parameters of buoyant plumes emitted from tall stacks located in various geographic regions of Canada characterized by flat terrain, land adjacent to large bodies of water, rolling terrain or mountain foothills, deep mountain and river valleys, arctic and sub-arctic regions. These parameters were evaluated and compared with standard predictive relationships established by Pasquill and Gifford.

PHYSICAL METALLURGY RESEARCH LABORATORIES

108 Buhr, R.K. "Inoculation of grey and ductile irons"; MRP/PMRL 81-56(OP)E; presented CANMET, Grey and Ductile Iron Workshop, Ottawa; Dec. 1981.

This paper describes various treatment techniques for the inoculation of grey and ductile irons and lists a number of the most widely used inoculants, along with typical compositions. The effects of typical inoculants on grey cast iron are also given.

109 Buhr, R.K. "New technology in grey and ductile irons"; MRP/PMRL 81-60(OP); presented CANMET, Grey and Ductile Iron Workshop, Ottawa; Dec. 1981.

Recent technological advances of interest to the Canadian foundry industry are outlined - compacted graphite iron, late inoculation, stream inoculation, in-mold inoculation, degradable sand binders, CANCOAT process.

110 Davis, K.G. "Alloyed grey and ductile cast irons"; MRP/PMRL 81-62(OP); presented CANMET, Grey and Ductile Iron Workshop, Ottawa; Dec. 1981.

Four main classes of alloyed irons are discussed: irons containing moderate alloying additions for improved room temperature strength; irons for use at elevated temperatures; irons for use in corrosive environments; and high-strength heat-treated ductile irons.

111 Davis, K.G. "Microstructure, heat treatment and properties of unalloyed grey and ductile cast irons"; MRP/PMRL 81-61(OP); presented CANMET, Grey and Ductile Iron Workshop, Ottawa; Dec., 1981.

An examination of the ASTM A48-76 "Standard Specification for Grey Iron Castings" indicates that cast iron is an alloy with unusual properties. This alloy shows remarkable flexibility. Using a suitable casting method and ladle treatment, castings with very different properties can be produced from the same base composition. Also, graphite irons are uniquely suited to the casting process. They have excellent fluidity, a reasonably low melting point, and an expansion created by graphite formation during solidification that approximates the total contraction, so that risering can be minimized or completely eliminated.

112 Godden, M.J., Ruddle, G.E., Crawley, A.F. and Boyd, J.D. "Modification of the austenite grain structure in a Mn-Mo-Nb steel by Ti-N additions"; ERP/PMRL 81-44(OPJ); presented Conf on Thermomech Proc Microalloyed Austenite, Pittsburgh, Pa.; Aug. 18, 1981.

The origin of mixed ferrite grain size in a microalloyed steel and specific effects of Ti-N additions were investigated by quenching specimens at various stages of the rolling schedule to follow the changes in austenite grain structure. Results show that microstructure and properties can be obtained in as-rolled plate of Ti-N steel using a relatively simple processing schedule.

113 Malis, T. and Chaturvedi, M.C. "Variations in grain boundary segregation for Al-8 Mg"; MRP/PMRL 82-1(OPJ); presented Ann Meet, Electron Microsc Soc Am, Washington, D.C.; Aug. 9-13, 1982 and in J Mat Sci.

The grain boundary segregation of Mg atoms in a high purity Al-8 wt % Mg alloy, water quenched from the solution heat treatment temperature, has been investigated by energy dispersive X-ray microanalysis in a TEM/STEM electron microscope. Many grain boundaries showed a segregation of Mg atoms to a level 2-3 times higher than the alloy composition. In the as-quenched state, Mg was uniformly distributed along the grain boundries, but formed clusters during ageing at room temperature. Hydrogen bubbles were often associated with these Mg rich regions. Mg depleted zones were observed adjacent to most boundaries, but in most cases on only one side of the boundary.

114 Sahoo, M., Barry, J.R. and Kleinschmidt, K. "Use of ceramic foam filters in the brass and bronze foundry"; MRP/PMRL 81-15(OPJ); presented 85th AFS Casting, Cincinnati, Ohio; April 27, 1981.

An investigation was made of the potential application of ceramic-foam filters in the casting of aluminum bronzes where dross inclusions are a problem. Aluminum-bronze castings of different designs were made of different alloys, using duplicate castings with and without filters in the gating system. Visual and radiographic examination showed that in all cases the filters significantly reduced or eliminated oxide inclusions and demonstrated the potential of these filters in the commercial production of premium-quality aluminum-bronze castings.

115 Sastri, V.S., Beauprie, R. and Desgagné, M. "Studies on molybdate as pipeline corrosion inhibitor in coal water slurries"; ERP/PMRL 81-71(OPJ); presented 7th Int Conf on Slurry Transportation, Las Vegas, Nevada; March 1982.

Wear rates of AISI 1010 steel in coal-water slurries both in the presence and absence of sodium molybdate were obtained. Wear rate data of AISI 1010 steel as a function of variables such as time, pH and molybdate concentration showed that 100 ppm of molybdate is quite effective at pH 8.5 as an inhibitor. Of the binary systems examined, the combination of sodium molybdate and sodium nitrite proved effective in reducing the wear. The multi-component system comprised of sodium molybdate, mercaptobenza-thiazole, zinc sulphate and sodium phosphate gave the best performance with a wear rate as low as 0.3 mm/a.

116 Shehata, M.T. and Boyd, J.D. "A technique to measure grain-size distributions in HSLA steels"; ERP/PMRL 81-41(OPJ); presented Ann Meet Inst Metall Soc Conf, San Francisco, Ca.; July 21, 1981.

A technique to measure ferrite grain-size distribution in materials with mixed grain sizes is described. It is shown that a bimodal grain size distribution can be identified by plotting the distribution on a log-normal probability graph. The relation between the two and three-dimensional grain-size distributions is discussed and it is demonstrated that the area fraction-size distribution in two dimensions corresponds well to the volume fraction-size distribution in three dimensions.

117 Warda, R.D. "Cupola practice for grey and ductile iron"; MRP/PMRL 81-65(OP); presented CANMET, Workshop on Grey and Ductile Iron, Ottawa; Nov.-Dec. 1981.

The significant variables in a cupola operation are identified and their influence on cupola efficiency and control are examined. These variables are subdivided into three main groups: cupola design, cupola inputs and cupola outputs. A fourth group consists of other variables which also significantly affect cupola efficiency and control.

118 Whiting, L.V., Sahoo, M. and Brown, D.A. "Structure and mechanical properties of aluminum bronze alloys cast in the ISO permanent test-bar mould"; MRP/PMRL 81-16 (OPJ); AFS Trans 89: 659-670; 1981.

Specific properties for permanent moulding were recently established by ISO 1338-1977, and the French bar was adapted as the standard chill-cast (permanent mould) bar. Consequently, CANMET undertook to manufacture and test such a mould. Five aluminum-bronze alloys were examined over a range of aluminum contents covered by ASTM specifications B148 and B505. Results are given for some short freezing-range copper alloys.

119 Whiting, L.V. "Ferrous foundry sand practice"; MRP/PMRL 81-66E(OP); presented PMRL Grey Iron Workshop, Ottawa; Nov.-Dec. 1981.

The basics of moulding sands are discussed and it is shown why they are important for grey and ductile iron castings. Criteria are given for selecting and testing sand, clay-bonded sand systems and chemically-bonded sand systems.

MINING RESEARCH LABORATORIES

120 Bigu, J. "Progress during 1981 in the environment projects for the CANMET Minerals Program"; MRP/MRL 81-72(OP); presented Joint Panel on Occupational and Environmental Research for Uranium Production in Canada, Elliot Lake; June 16-17, 1981.

A summary is given of the main project element objectives and outputs of the environment projects (underground and surface) carried out by CANMET pertaining to six general areas of interest: radiation source identification, measurement and control; dust source identification, measurement and control; diesel emissions measurement and control; ventilation network R/D; noise/vibration evaluation and control; methods of treating tailings.

121 Bigu, J. "Continuous monitoring of radiation variables in the underground environment"; MRP/MRL 81-86(OP); presented Internal Seminar on Continuous Monitoring, CANMET, Ottawa; July 29, 1981.

A brief review of instrumentation for the continuous monitoring of radiation variables in the underground environment is presented. The merits, disadvantages and main uses of the above instrumentation are shown.

122 Bigu, J. "Mine models and the thoron problem in underground uranium mines"; MRP/MRL 81-112(OPJ); presented Int Conf on Radiation Hazards in Mining: Control, Measurement and Medical Aspects, Golden, Colorado; Oct. 4-9, 1981.

Several theoretical models were used to predict radiation levels in underground uranium mines. Calculations based on these models were extended to include thoron gas and its progeny. Theoretical predictions included radon and thoron progenies, working levels and concentrations and some ratios of great practical interest. Differences between the models are pointed out and a comparison is made with data gathered during the last three years. It was found that more than one model perdicts the same, or approximately the same results for a given radiation variable or ratio of variables.

123 Bossert, J.A. "Testing procedures for fire-resistant materials"; ERP/MRL 82-5(OPJ); presented CIM 84th Ann Gen Meet, Quebec City; April 1982.

This paper outlines existing test requirements of the Canadian Standards Association Steering Committee for Electrical/Mechanical Mine Safety.

124 Cochrane, T.S. "Coal mining on Vancouver Island"; ERP/MRL 81-141(OPJ); presented Can Inst Min Metall Ann Meet, Quebec City; April 25-28, 1981.

An overview is presented on the history of coal mining on Vancouver Island which includes a description of the Island's geology, mining methods, constraints, and comments on the possibility of revitalizing the industry.

125 Dainty, E.D. and Mogan, J.P. "A summary of the diesel vehicle emissions reduction program in Canada"; ERP/MRL 81-16(OPJ); presented Int Safety in Mines Res Conf, Katowice, Poland; Oct. 6-14, 1981. (Will be published in Proc.)

A summary is presented of several diesel exhaust toxicity reduction strategies relevant to underground health and safety being studied at CANMET. The assessment of toxicity emissions is made using the Health Effects Index (HEI), a concept which provides for additive and synergistic effects of the several toxic components of diesel exhaust including the particulate matter.

126 Dainty, E.D. and Mogan, J.P. "Health and safety considerations related to the use of diesel-powered equipment in underground coal mines"; ERP/MRL 81-61(OP); presented "Inquiry into Underground Coal Mine Safety in Alberta" at Mine Environment/Mining Research into Safety Workshop; June 23, 1981.

A brief is presented of the experience gained at the Canadian Explosives Atmospheres Laboratory (CEAL) of CANMET in the areas of flameproof diesel machinery certification and exhaust emissions toxicity reduction R & D.

127 Dainty, E.D. and Mogan, J.P. "Summary of diesel exhaust emissions filter development at CANMET"; MRP/MRL 81-118(OP); presented USBM/CANMET collaborative diesel emissions toxicity reduction demonstration planning group, Pittsburgh, Pa.; Sept. 28, 1981.

Results are given from two filter performance trials undertaken at CANMET on an F6L 912W Deutz low emissions diesel engine. The filters tested were: (1) a graphite-impregnated fibre glass cloth type developed in-house to full scale and (2) a ceramic honeycomb type produced by Corning Glass. The Corning filter was chosen for further development.

128 Darling, J.A. "Burning trials of a test container protecting detonators from fire"; MRP/MRL 81-104(OP); presented 21st Session Group of Experts on Explosives, Geneva; Oct. 12, 1981.

A burning test is described of an airtight insulated container to determine precautions necessary to permit safe transporting of detonators and blasting explosives in the same vehicle. It is concluded that a detonator compartment incorporating an airtight steel layer and a complete covering of 3-cm thick pressed glass fibre insulation presents no significant hazards in addition to those which would exist if the detonators and blasting explosive were in separate loads.

129 Das, B. "Status of computer applications for underground coal mining methods evaluation"; ERP/MRL 81-35(OPJ); presented 83rd Ann Gen Meet, Can Inst Min Metall, Calgary; May 3-6, 1981.

A review is made of the status of computers in underground coal mining methods evaluation to define their scope for further application. This paper discusses the roles of the mining engineer, programmer, computer operator, analyst and computer. The important parameters are identified and discussed along with their application for different underground coal mining methods with individual unit processes, particularly covering longwall face operations.

130 Davé, N.K., Lim, T.P. and Vivyurka, A.J. "Chemical and radioisotope distribution profiles in an abandoned uranium tailings pile"; MRP/MRL 81-109(OPJ); presented seminars sponsored by Saskatchewan Environment, Regina; Oct. 5 and Saskatoon, Oct. 6, 1981. Also presented 4th Symp on Uran Mill Tailings Management, Fort Collins, Colorado; Oct. 26-28, 1981.

An investigation was conducted to determine development trends of chemical and radioisotope distribution profiles in the solid phase in an abondoned uranium tailings pile at Elliot Lake, Ontario. Solid core samples collected with split spoon and modified Shelby tube samplers at various depths were analyzed for various chemical and radioisotope constituents. Results show that the concentration of chemical and radionuclide constituents is taking place near the bottom of the tailings layer which is in contact with the original pore water. Little evidence of contaminant penetration below the peat layer was observed except soluble gypsum due to the groundwater geology and sorption capacity of the peat layer.

131 Feng, K.K, Chung, W.K., Yu, J.M. and Yu, B.C-Y "Formation and distribution of hot spots in slurry explosives under projectile impact"; MRP/MRL 81-9(OPJ); presented 7th Symp (Int) on Detonation, U.S. Naval Academy, Annapolis, Maryland; June 16-19, 1981. (Will be published in proc.)

The behaviour of slurry explosives of hypothetical compositions under projectile impact during the buildup period but before combustion takes place was studied by a numerical method. Parameters investigated included ratio of solid explosive to liquid, volume percentage of air, temperature dependence of γ, effect of entrained gas other than air, initial temperature of the explosive and projectile velocity. Maximum amounts of air which are entrained in slurry explosives having different solid to liquid ratios that may be initiated by impact induced hot spots under the conditions investigated are suggested.

132 Feng, K.K., Contestabile, E. and Craig, T.R. "Thermal conductivity of slurry explosives"; MRP/MRL 81-70(OPJ); presented 11th Symp on Explosives and Pyrotechnics, Philadelphia, Pa.; Sept. 15-17, 1981. (Will be published in proc.)

A transient hot wire method was used for determining thermal conductivity of different types of slurry explosives in their natural packaged state. The thermal conductivity values obtained from the cooling cycle agree well with those obtained from the heating cycle. It was also found that in the aged samples thermal conductivity decreases. From the reproducibility and the accuracy of the experimental results and safety design of the probe, the method proved to be quick and safe.

133 Fisekci, M.Y. and Parkes, D. "Deformation analysis of underground openings and pillars during hydraulic mining of thick and steep seams in Western Canada"; ERP/MRL 82-7(OPJ); presented 7th Int Strata Control Conf, Liége, Belgium; Sept. 20-24, 1982.

The mining of a 16-m thick coal seam dipping from 10-50° in the Rocky Mountains was done by hydraulic jet. The layout comprised sub-levels 25 m apart driven up at about 7°. The pillars formed are subsequently cut out by water jet on the retreat. Fast production rates up to 8000 t/d have been achieved using one active monitor fed from two 2500 H.P. pumps. The resultant slurry is screened prior to pumping out the minus 4-mm coal with the water. A ground control study indicated that the last portion of the hydraulic mine was operating in destressed zones where the abutment pressures were distant from the working area due to the cushioning effect of the soft pre-fractured thick coal. Strata mechanic studies were carried out using the wire extensometer and hydraulic pressure recording methods applied both in coal and associated strata.

134 Herget, G. and Gerg, O. "Research requirements in surface mine stability and planning"; MRP/MRL 81-49(OPJ); presented 3rd Int Conf on Stability in Surface Mining, Vancouver; June 1-3, 1981.

Based on a review of published data and discussions with operators and planners it appears that the current stagnant productivity trends in open pit mining and rising costs cannot be changed if the industry stays with its present or conventional technology. The following four areas offer the greatest potential for productivity improvements in open pit mining operations during the 1980's: development of more economical systems to haul ore and waste material; improvements in drilling and blasting technology; reduction of stripping ratio; and optimization of mine planning using computers.

135 Kirk, B. "Eriometry as a dust measurement technique for use in underground mines"; MRP/MRL 81-23(OP); presented Conf on Lasers and Electro-Optics, Wash., D.C.; June 10-12, 1981.

Eriometry is being developed to monitor continuously dust levels in underground mines. This paper discusses a design for a low cost, flexible eriometer which is easily adapted to meet a variety of tasks. Experimental results and tests on the accuracy and reproducibility of the system are also reported.

136 Knight, G., Bigu, J., Mogan, P. and Stewart, D.B. "The size distribution of airborne dust in mines"; MRP/MRL 81-115(OPJ); presented Int Symp on Aerosols in the Mining and Indust Work Environment, Minneapolis, Minn.; Nov. 2-6, 1981.

Airborne dust was collected from three uranium mines on two-stage samplers. The dust was assessed by X-ray diffraction for quartz and mineral dust and by scintillation and counting for radon and thoron daughters. Results show that daughters are not associated with particles as assessed by mass.

137 Laroceque, G.E. "Methodology overview - rock mechanics/rock properties"; MRP/MRL 81-144(OPJ); presented 12th Nuclear Fuel Waste Management Information Meet, Univ Waterloo, Jan. 27-28, 1982 and in Proc.

A detailed discription is given of EMR's Rock Properties Activity and the needs of an overall rock mechanics program in the High Level Nuclear Waste Management Program are outlined.

138 Mogan, J.P. and Dainty, E.D. "The implications for mine operators of Canadian diesel fuel trends in the 80's"; ERP/MRL 81-108(OP); presented 6th Ann District Meet, Can Inst Min Metall; Oct. 29-31, 1981.

The new Canadian general specifications for diesel fuels are intended to encompass a broader range of hydrocarbon material, thus increasing available supplies. Revised limits which will have an impact on underground mining include flash point (lower), cloud and pour points (more variable), distillation range (wider), per cent sulphur (limit lower, trend higher) and cetane number (lower). Overall, changes in fuel properties can be expected to result in higher levels of pollutants in diesel exhaust. A "premium" mining fuel specification has been proposed which will maintain exhaust emissions at their current levels.

139 Mogan, J.P., Katsuyama, K. and Dainty, E.D. "The emission control system on the Volvo BM 861 U underground truck"; MRP/MRL 81-30(OPJ); presented 83rd Ann Gen Meet, Can Inst Min Metall, Calgary; May 1981.

A summary is provided of the performance of the components of the Volvo BM 861 U unit as evaluated by full-scale dynamometer testing. These units are manufactured under the same corporate roof as the engine manufacturer which provides an opportunity for the characteristics of the entire system - turbocharged aftercooled engine, transmission, and exhaust scrubber - to interact to minimize emission levels.

140 Morin, K.A., Cherry, J.A., Lim, T.P. and Vivyurka, A.J. "Contaminant migration in a sand aquifer near an inactive uranium tailings impoundment, Elliot Lake, Ontario"; MRP/MRL 81-114(OPJ); presented Seminars sponsored by Saskatchewan Environment, Regina, Oct. 5 and Saskatoon, Oct. 6, 1981 and in Can Geotech J 19:1; 1982.

To assess final abandonment schemes for and environmental impact of uranium mill tailings, an investigation of the movement of contaminated groundwater from inactive uranium tailings through a sand aquifer is being conducted at the Nordic Main tailings impoundment near Elliot Lake, Ontario. During 1979-1980, a network of multilevel bundle-type piezometers was installed in the sand aquifer. Data obtained in 1980 are presented and show the first direct evidence of plume movement by comparing 1979 and 1980 contaminant distributions.

141 Pathak, J. "Haulage related accidents in Canada"; MRP/MRL 81-39(OP); presented 50th Ann Meet, MAPAO, Toronto; May 20-22, 1981.

A comparison is made between haulage and ground control related injuries from statistics on underground hard rock mine accidents. Accident records of mines in different provinces of Canada, U.S.A., South Africa and Sweden are compared on the basis of fatal and compensable injuries per 10^6 man-hours. An analysis is made of frequencies of injuries for track and trackless equipment and conveyors and the main causes are isolated. A recommendation on preventing haulage related injuries is presented.

142 Sabourin, R. "Geostatistics, as a tool to define various categories of resources"; ERP/MRL 81-111(OPJ); presented 10th Geochautauqua on Computer Applications in the Earth Sciences sponsored by GSC; Oct. 23-24, 1981.

Definitions of "measured" and "indicated" resources tend to be vague. Yet, the calculation of such categories of resources in a mineral deposit calls for specific technical criteria, the selection of which depends upon the method of evaluation. This paper discusses how a geostatistical methodology provides the technical criteria required to classify reasonably assured resources by levels of assurance of their existence.

143 Savich, M.U. "New generation of noise dosimeters in Canadian mines"; MRP/MRL 81-106(OP); presented Canadian Acoustical Assoc Ann Symp, Edmonton, Alta.; Oct. 8-9, 1981.

Advances made in noise abatement during the past 10 years are outlined. The important role of computer programs is exemplified.

144 Srajer, V. and Chiang, C. "The development and application of a model for preliminary selection of bucket wheel excavator"; ERP/MRL 82-13(OP); presented 84th Ann Gen Meet, CIM, Quebec City; April 25-28, 1982.

Six basic computer programs are described as guidelines for selecting a bucket wheel excavator to meet various mine designs.

SECTION 4

DIVISIONAL REPORTS

The reports listed below are available for purchase in microfiche or paper copy from Micromedia Limited, Box 502, Station S, Toronto, Canada, M5M 4L8.

MINERAL SCIENCES LABORATORIES

TECHNICAL REPORTS (TR)

145 MRP/MSL 78-123(TR). Steger, H.F. "The effect of temperature, pH, paraticle size and air flow on the formation of thiosalts in sulphide mineral suspension"

146 ERP/MSL 80-158(TR). Ritcey, G.M. "Proceedings of the meeting of the Canadian Uranium Producers' metallurgical committee held in Ottawa"

147 MRP/MSL 81-4(TR). Hughson, M.R. "Size analyses of sphalerite, galena and chalcopyrite in drill cores from the east sulphide body of the Caribou deposit, New Brunswick"

148 MRP/MSL 81-8(TR). Bartels, K. "UV spectral characteristics of selected thiosalts"

149 ERP/MSL 81-11(TR). Wheat, T.A. "The CANMET Program to develop solid electrolytes"

150 MRP/MSL 81-15(TR). Bowman, W.S. and Sutarno, R. "Personal dust sampling in mines: Normality test for quartz dust"

151 MRP/MSL 81-17(TR). Silver, M. and Taylor, J.B. "Assessment of the microbial populations in field and test pit experiments at Elliot Lake, Ontario, Canada"

152 MRP/MSL 81-18(TR). Palmer, J. "Cost estimates for producing alumina by a soda-lime sinter process using Hat Creek coaly waste as the source of both alumina and energy"

153 ERP/MSL 81-35(TR). Haque, K.E. "Hydrochloric acid leaching of a Bancroft uranium ore"

154 MRP/MSL 81-37(TR). MacKinnon, D.J. and Brannen, J.M. "The effect of cobalt on zinc deposit structures electrowon from industrial acid sulphate electrolytes"

155 ERP/MSL 81-43(TR). Haque, K.E. "Chlorine-assisted leaching of Key Lake uranium ore"

156 MRP/ERP/MSL 81-48(TR). "Mineral Sciences Laboratories Annual Progress Report 1980-81"

157 MRP/MSL 81-49(TR). Rolko, V.H.E. "Progress report on quartz analysis in mine dust by infrared absorption"

158 ERP/MSL 81-57(TR). Haque, K.E. "Chlorine-assisted leaching of Rabbit Lake uranium ore"

159 MRP/MSL 81-58(TR). Dutrizac, J.E. "The leaching of a pyritic Zn-Pb-Cu-Ag bulk concentrate in ferric chloride media"

160 ERP/MSL 81-70(TR). Gilmore, A.J. "The removal of radioactive radium (Ra^{226}) from chloride liquors by columnar exchange in the presence of calcium, magnesium and iron cations - Progress report No. 3"

161 MRP/MSL 81-71(TR). Petruk, W. "Mineralogical study to determine the source of gold lost in tailings"

162 MRP/MSL 81-75(TR). Rolia, E. "The kinetics of decomposition of thiosalts by metallic iron"

163 MRP/MSL 81-87(TR). Soles, J.A. "Mineralogy of a powder from the Mining Research Laboratories, Bells Corners complex"

164 MRP/MSL 81-91(TR). Hamer, C.A. "Hydrochloric acid leaching of alumina from Ontario and Quebec anorthosites"

165 MRP/MSL 81-94(TR). Jambor, J.L. "Examination of samples of altered massive sulphides from the Caribou deposit, Bathurst area, New Brunswick"

166 MRP/MSL 81-95(TR). Petruk, W. "Mineralogy of mill products from Marmine sand"

167 MRP/MSL 81-96(TR). Petruk, W. "Mineralogical analysis of mill products produced from an R.P.C. sulphation roast residue"

168 MRP/MSL 81-110(TR). Brandes, D., Bedard, P.L. and Bartels, K. "Solubililty of $PbCl_2$ in hydrometallurgical solutions: IV. Construction and calibration of a sampling in the range 20°C to 95°C"

169 MRP/MSL 81-112(TR). Wong, W.S. "Preliminary capital and operating cost estimates for the catalytic oxidation of thiosalts"

170 MRP/MSL 81-114(TR). McGaw, G. and Dutrizac, J.E. "Gravimetric determination of elemental sulphur chalcopyrite leaching"

171 ERP/MSL 81-128(TR). Haque, K. and Ipekoglue, B. "Hydrochloric acid leach of Agnew Lake uranium concentrate"

172 MRP/MSL 81-132(TR). Rolia, E. "The oxidation of thiosalts in strongly alkaline media"

173 MRP/MSL 81-133(TR). Bowman, W.S. "Operational procedures for computer-drawn graphs"

174 MRP/MSL 81-134(TR). MacKinnon, D.J., Brannen, J.M. and Morrison, R.M. "The effects of nickel and β-naphthol on zinc electrowinning from industrial acid sulphate electrolytes"

175 ERP/MSL 81-137(TR). Wheat, T.A. and Starchuk, J.M. "An overview of the synthesis of Na-zirpsios by various processes"

176 ERP/MSL 81-138(TR). Haque, K.E. "Hydrochloric acid leaching of Rabbit Lake uranium ore"

177 MRP/MSL 82-16(TR). Dutrizac, J.E. and O'Reilly, J.B. "A listing of documents produced as part of CANMET's thiosalt program"

INVESTIGATION REPORTS (IR)

178 MRP/MSL 80-99(IR). Jongejan, A. "The effects of low ambient-temperatures on the composting of garbage"

179 MRP/MSL 80-138(IR). Wang, S.S., Winer, A.A. and Sirianni, G. "Preliminary experiments: Melting and fiberizing a mixture of pelletized blast furnace slag-quartz"

180 MRP/MSL 80-166(IR). Raicevic, D. and Raicevic, M. "Preconcentration of a low-grade uranium ore yielding tailings of greatly reduced environmental concerns Part V: CPDU investigation of Agnew Lake ore: 0.057% U"

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293 ERP/MRL 81-105(TR). Gorski, B. "Sample size versus porosity by mercury porosimeter for WN-1 samples"

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305 MRP/MRL 81-131(TR). Yu, Y.S., Toews N.A. and Wong, A.S. "MINTAB User's Guide - A mining simulator for determining the elastic response of strata surrounding tabular mining excavators (Version 2.0, 1981)"

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309 MRP/MRL 81-137(TR). Herget, G. "Rock mass classification at Copper Cliff South mine"

310 MRP/MRL 81-138(TR). Mears, A. "A comparison of a new software package and the plot 10 terminal control system"

311 MRP/MRL 81-140(TR). Wong, A.S. "Petrographic analysis of selected non-standard core samples from borehole WN-1, Pinawa, Manitoba"

312 MRP/MRL 81-142(TR). Szymanski, J.T. and Ralph, M.S. "Comparison of results from EMR & NCB flame tests"

313 MRP/MRL 81-143(TR). Mears, A. "Smooth curve drawing: Subroutine fline"

314 MRP/MRL 82-1(TR). Gyenge, M. "Rock bolting"

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316 MRP/MRL 82-3(TR). Bigu, J. "Progress report on a technical evaluation of four personal alpha-dosimeters in two underground uranium mines in the Elliot Lake area"

317 MRP/MRL 82-4(TR). Herget, G. and Oliver, P. "Pillar stress determinations at Copper Cliff South mine"

318 ERP/MRL 82-6(TR). Jackson, R., and Mears, A. "Dilatational velocity, Young's modulus, Poisson's ratio and uniaxial compressive strength for ATK-1 samples"

319 MRP/MRL 82-8(TR). Gyenge, M., Gorski, B. and Shimotani, T. "Strength determination of rocks at Copper Cliff South mine"

320 ERP/MRL 82-10(TR). Das, B.M. "The concept of statical and dynamical loading in relation to rate of loading"

321 ERP/MRL 82-11(TR). Jackson, R. "High temperature and pressure triaxial compression tests on rock samples from Pinawa and Creighton mine"

322 ERP/MRL 82-13(TR). Srajer, V. and Chiang, C. "The development and application of a model for preliminary selection of bucket wheel excavator"

323 MRP/MRL 82-15(TR). Biagé, D. "Documentation of MRL CALCOMP logarithmic plotting routines"

324 MRP/MRL 82-17(TR). Wang, K., Kapeller, F. and Stewart, D.B. "Ground vibration measurements at Prince mine"

325 ERP/MRL 82-18(TR). Szymanski, J.T. and Ralph, M.S. "Comparison of results obtained from EMR and NCB flame tests - Part 2 - Unilok Belting Division, PCV fire resistant conveyor belts"

326 MRP/MRL 82-19(TR). Murray, D. and Turcotte, M. "Tree growth studies on uranium mill tailings"

327 ERP/MRL 82-20(TR). Wong, A.S. "Rock property data file for radioactive waste disposal project - Revision A"

328 ERP/MRL 82-21(TR). Srajer, V. "Rheinland lignite mines in Germany"

329 ERP/MRL 82-23(TR). Dainty, E.D. and Mogan, J.P. "The collaborative North American mining diesel emissions reduction program"

330 MRP/MRL 82-24(TR). Grenier, M. and Bigu, J. "Experimental procedures for the calibration or scintillation cells used in the determination of radon gas concentrations"

331 MRP/MRL 82-25(TR). Bigu, J. "On the effect of a negative ion-generator and a mining fan on the plate-out of radon decay products in a radon box"

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333 ERP 81-1. Energy Research Program Office. "Energy technology activity long-term plans 1981-86"

334 ERP 81-2(TR). Reeve, D.A. "CANMET participation in technology exchange agreements through the International Energy Agency"

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SECTION 5

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337 IR 56-16. Kaiman, S. "Mineralogy of uranium ore samples from the Fay and Verna mines, Eldorado Beaverlodge Division, Eldorado, Saskatchewan"

338 IR 243-57. Gilmore, A.J. and Harrison, V.F. "Exploratory tests on solvent extraction of uranium from ion exchange eluates"

339 IR 468-57. Bellingham, A. and Simard, R. "Recovery of uranium from Rexspar leach by solvent extraction with tri-iso-octylamine"

340 IR 58-8. Bright, Norman F.H. "The investigation of certain uranium oxide samples produced at the University of British Columbia, Vancouver, by hydrometallurgical techniques"

341 IR 58-20. Bright, Norman F.H. and Jongejan, Arnout "Examination of certain uranium trioxide hydrate samples from Eldorado Mining and Refining Limited, Port Hope, Ontario, in relation to their pelleting behaviour"

342 IR 58-30. Simard, R. "Recovery of thorium by solvent extraction from ion exchange barren effluents received from the Bicroft and Faraday (Ontario) uranium milling plants"

343 IR 58-77. Nickel, E.H. "A mineralogical investigation of rare earth carbonate ore in drill core from the Oka, Quebec property of Quebec Columbium Limited"

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345 IR 58-178. Simard, R., McNamara, V.M., Harrison, V.F. and Gow, W.A. "Recovery of uranium from Rexspar (Birch Island, B.C.) leach solution extraction with alamine"

346 IR 59-15. Rowland, J.F. "X-ray diffraction investigations on a piece of turbine blade submitted by the British Columbia Research Council"

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350 IR 59-80. Rowland, John F. "X-ray diffraction and spectrographic investigations of material from the wreckage of an aircraft submitted by the British Columbia Research Council"

351 IR 59-88. Nickel, E.H. "An investigation into the iron content of two zinc concentrates from Quemont Mining Corporation, Noranda, Quebec"

352 IR 59-109. Jenkins, W.S. "Investigation of iron ore from Calvin Township, Ontario, submitted by Peerless Canadian Explorations Ltd., Toronto"

353 IR 60-1. Nickel, E.H. "The distribution of the niobium content between light and heavy fractions in ore samples from Quebec Columbium Limited, Oka, Quebec"

354 IR 60-25. Nickel, E.H. "The iron content of sphalerite samples from Quemont Mining Corporation, Noranda, Quebec"

355 IR 60-39. Nickel, Ernest H., Bright, Norman F.H. and Lepine, E.E. "A mineralogical analysis of two samples of oolitic iron ore from the Clear Hills area of Alberta"

356 IR 60-47. Nickel, E.H. "A mineralogical investigation of nickel ore from the Timiskaming District of Ontario, submitted by Fatima Mining Company, Limited"

357 IR 60-48. Eichholz, G. "Use of solution monitor on Beaverlodge leach liquors"

358 IR 60-50. Eichholz, G. and McMahon, C. "Search for protactinium-231 in uranium leach liquors"

359 IR 60-74. Keys, J.D. "Measurement of sodium losses in a leach circuit"

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397 IR 61-145. Eichholz, G. "Residence time measurements of a shaft furnace for the Iron Ore Co. of Canada Ltd."

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563 IR 66-92. Sirois, L.L., Page, A. and Raicevic, D. "Calcite flotation of pyrochlore ore from St. Lawrence Columbium and Metals Corporation, Oka, Quebec"

564 IR 66-9. Berry, T.F. "Concentration of a cobalt-nickel ore from Rusty Lake Mining Corporation Ltd., Gowganda, Ontario"

565 IR 66-100. Wyman, R.A. "Tabling tests on barite-fluorite samples from Lake Ainslie, N.S."

566 IR 67-6. Wilson, H.S. "Assessment of shales and slates from N.B. for production of lightweight aggregate"

567 IR 67-14. Mathieu, G.I. "Recovery of gold from old mill tailings for M.S.M. Minerals Ltd., Kirkland Lake, Ontario"

568 IR 67-17. Llewellyn, T.O. "Concentration of magnetite ore from Jaybee Landry Exploration and Mining Co. Ltd., Sudbury, Ontario"

569 IR 67-18. Stemerowicz, A. "Investigation of lead-zinc and copper-zinc ores from the Kidd Township property of Texas Gulf Sulphur Company"

570 IR 67-19. Hanes, F.E. "Sand manufacturing from an Ottawa Valley limestone"

571 IR 67-27. Mathieu, G.I. "Laboratory and pilot plant investigation on molybdenite-bismuth ore from Moly Hill Mining Corporation Ltd., Rouyn, Quebec"

572 IR 67-32. Wilson, H.S. and Buchanan, R.M. "Appraisal of a volcanic material as lightweight aggregate"

573 IR 67-33. Riley, G.W. "Jigging investigation of upgraded ore from Crest Exploration Ltd."

574 IR 67-38. Winer, A.A., Page, A. and Sirois, L.L. "A study of surface characteristics of selected asbestos fibre by electrophoresis"

575 IR 67-43. Wall, Arthur W. "A laboratory and pilot plant investigation on silver concentrate from Cobalt Refinery Division, Kam-Kotia Mines Ltd., Cobalt, Ontario"

576 IR 67-46. Sutarno, R., Bowman, W.S., Tippins, J. and Alexander, G.E. "Ferrites: Part III. Construction and operation of a magnetic orienting press for the fabrication of anisotropic ferrite magnets"

577 IR 67-50. Mathieu, G.I. "Investigation of a gold-silver ore from the Lynn Lake, Manitoba property of Agassiz Mines Ltd."

578 IR 67-54. Owens, D. "Mineralogical examination of a copper ore from Caribou Bell Copper Mines Limited, Vancouver, British Columbia"

579 IR 67-55. Mathieu, G.I. "Recovery of silver and zinc from two ore samples from Creswell Mines Limited, Port Arthur, Ontario"

580 IR 67-60. Mathieu, G.I. "Investigation of a low-grade nickel mineralization from Sutherland and Associates, Blind River, Ontario"

581 IR 67-63. Stemerowicz, A. "Pilot plant investigation of copper-nickel ore from Great Lakes Nickel Corporation Ltd., Pardee Tp., Thunder Bay District, Ontario"

582 IR 67-77. Stemerowicz, A. and Bruce, R.W. "Concentration of a copper ore from the Canam property of Giant Mascot Mines Limited, Hope, B.C."

583 IR 67-88. Mathieu, G.I. and Bruce, R.W. "Flotation investigation on a gold ore from Campbell Red Lake Mines Ltd., Balmertown, Ontario"

584 IR 67-92. Stemerowicz, A. and Bruce, R.W. "Concentration of a copper ore from the R.M. Clarke Mining Co. Ltd., Parry Sound, Ontario"

585 IR 68-5. Mathieu, G.I. and Bruce, R.W. "Investigation of gold-silver-copper ore from Pyrotex Mining & Exploration Co., Ltd., North Caribou Lake, Ontario"

586 IR 68-67. Sirianni, G.V. "Electric smelting of nickeliferous magnetite in the 60-KAV electric arc-furnace to produce low-grade ferronickel for Carey Canadian Mines Ltd., East Broughton, Quebec"

587 IR 68-70. Hartman, F.H. and Wyman, R.A. "Beneficiation of barite-fluorite from Lake Ainslie, Nova Scotia (Project MP-MIL-207)"

588 IR 68-78. Riley, G.W. "Recovery of iron from an iron-rich reject sample of Carey-Canadian Mines Limited, East Broughton Station, Quebec"

589 IR 69-19. Owens, D. "Mineralogical investigation of a sample of a tungsten ore from York County, N.B. on behalf of Burnt Hill Tungsten and Metallurgical Limited"

590 IR 69-33. McNamara, V.M., Weston, T.B. and Webster, A.H. "Lead zirconate-titanate ceramics prepared from co-precipitated powders modified with strontium, iron and chromium oxides"

591 IR 69-34. Godfrey, K.V. "Preliminary report on the application of portable X-ray fluorescence equipment to the determination of iron and manganese in ores"

592 IR 69-56. Riley, G.W. "Concentration tests on a pyrochlore from Argor Explorations Limited"

593 IR 69-82. Sutarno, R., Bowman, W.S. and Alexander, G.E. "Investigation of the use of by-product iron oxide in "Hard" ferrite manufacture, on behalf of the Steel Company of Canada Limited, Hamilton, Ontario"

594 IR 69-84. Wilson, H.S. "Assessment of vermiculite-bearing drill-core samples from Stanleyville, Ontario"

595 IR 70-2. Godfrey, K.V. "The application of a portable X-ray fluorescence analyzer to the control of a grinding circuit"

596 IR 70-6. Mathieu, G.I. and Bruce, R.W. "High-intensity-magnetic separation of a tungsten ore, from the Grey River property of American Smelting and Refining Company, Buchans, Newfoundland"

597 IR 70-10. Owens, D.R. "Mineralogical investigation of a sample of zinc-lead-copper ore from Cadillac Explorations Limited, Prairie Creek, N.W.T."

598 IR 70-20. Hanes, F.E. "Assessment of a black granite rock from the Peribonka area, P.Q., for use as monumental and building stone"

599 IR 70-49. Vaughan, D.J. "Investigation of reduced Dominican Republic ore by Mossbauer spectroscopy for Falconbridge Nickel Mines Limited"

600 IR 70-62. Owens, D. "Mineralogical investigation of a sample of nickel-copper ore from the Nicopor property of Zenmac Metal Mines Limited, Schreiber, Ontario"

601 IR 71-22. Pinard, R.G. "Mineralogical investigation of a lead-zinc-silver ore from the Reeves-MacDonald Mines Limited, Prairie Creek, N.W.T."

602 IR 71-25. Nickel, E.H. "Mineralogical evaluation of iron concentrates from the Iron Ore Company of Canada, Schefferville, Quebec"

603 IR 71-27. Harris, D.C. "Mineralogical investigation of the low-grade nickel-bearing serpentinite of Dumont Nickel Corporation, Val d'Or, Quebec"

604 IR 71-31. Palfreyman, M. "Further evaluation of a British Columbia magnesite as a refractory raw material"

605 IR 71-38. Nickel, E.H. "The occurrence of nickel in ore samples from Dumbarton Mines Limited, Bird River, Manitoba"

606 IR 71-40. Wilson, H.S. "Assessment of vermiculite from vicinity of Venosta, Quebec"

607 IR 71-70. Raicevic, D. and Bruce, R.W. "Tungsten concentration from Grey River property of American Smelting and Refining Company, Newfoundland"

608 IR 71-80. Harris, D.C. "Mineralogical investigation of a nickel-copper pipe ore for International Nickel Company of Canada, Thompson, Manitoba"

609 IR 71-81. Soles, James A. "A petrographic investigation of soil gravel from the site of the proposed international airport, St. Scholastique, Quebec"

610 IR 71-83. Wyman, R.A. and Hartman, F.H. "Examination of a bulk sample of kimberlite for diamond content"

611 IR 72-13. Owens, D.R. "Mineralogical investigation of an antimony ore from a deposit located in South Ham Township, Quebec, on behalf of Quebec Antimony Mines Limited"

612 IR 72-20. Johnson, A.E. "Mineralogical investigation of a gold-silver ore from Kleanza Mountain Terrace area, British Columbia"

613 IR 72-37. Harris, D.C. "Mineralogical investigation of a Cu-Ag ore of Terra Mining and Exploration, Camsell River, Northwest Territories"

614 IR 72-38. Harris, D.C. "Mineralogical examination of a coarse tantalum concentrate from Tantalum Mining Corporation (Tanco), Bernic Lake, Manitoba"

615 IR 72-53. Harris, D.C. "Mineralogical examination of a low-grade Ni-Cu-bearing peridotite from the Mattagami Lake Mine, Mattagami, Quebec"

616 IR 72-54. Harris, D.C. "Mineralogical examination of tantalum concentrates, DR-9 and DR-10, from the Tantalum Mining Corporation of Canada Limited (Tanco), Bernic Lake, Manitoba"

617 IR 72-57. Cabri, L.J. and Laflamme, J.H.G. "Mineralogical investigation of low-grade nickel drill core from claims near Giant Mascot Mines Limited, British Columbia"

618 IR 72-75. Bailey, R.P. "Comparative gold precipitation tests on "Durham Ultrafine" and "Durham Standard" zinc dusts submitted by Dillons Chemical Co. Ltd., Montreal, Quebec"

619 IR 73-2. Berry, T.F. "Gold losses in the treatment of a placer deposit in the Ashcroft area of British Columbia"

620 IR 73-6. Mathieu, G.I. and Bruce, R.W. "Flowsheet development for processing an antimony ore from South Ham Township, Quebec"

621 IR 73-13. Zoldners, N.G. and Painter, K.E. "Pelletized expanded-slag aggregate for structural lightweight concrete"

622 IR 73-17. Cabri, L.J. "Mineralogical investigation of hand samples from the Strathcona lead-zinc deposit, Baffin Island"

623 IR 73-27. Harris, D.C. "Mineralogical investigation of a Cu-Ag-Bi ore from Terra Mining and Exploration Limited, Camsell River, Northwest Territories"

624 IR 73-41. Johnson, A.E. "Mineralogical investigation of sulphurous coal from the Lingan Mines, Cape Breton Island, Nova Scotia"

625 IR 73-50. Raicevic, D. and Bruce, R.W. "Process development for the concentration of copper, gold, silver, and tungsten minerals from ores of Robert Mines Limited, Nelson, B.C."

626 IR 73-65. Atkinson, K.D. "Laboratory support for spodumene pilot plant trials"

627 IR 73-72. Collings, R.K. and Brown, G.A. "The feasibility of producing a dry-pressed building brick with tailings from a Quebec iron mine"

628 IR 74-19. Klymowsky, L.B. "An investigation to determine causes for the variation in the flotation behaviour of iron ore from Schefferville, Quebec"

629 IR 74-44. Hartman, F.H. and Wyman, R.A. "Beneficiation of graphite from Mont Laurier, Quebec (Project MP-IM-7106)"

630 IR 74-49. Raicevic, D. and Bruce, R.W. "Determination of gold and platinum content in a low-grade alluvial gravel from the Tulameen River area of British Columbia"

631 IR 74-72. Palfreyman, M. "Evaluation of an Ontario dolomite as a refractory raw material"

632 MRP/MSL 75-1(IR). Feasby, D.G. "Utilization of waste: experimental production of bricks for dicalcium silicate slag"

633 MRP/MSL 75-2(IR). Churchill, T.R. and Mason, G.L. "Homogeneity tests on copper and copper alloys"

634 MRP/MSL 75-4(IR). Weston, T.B. "Microwave dielectric studies program"

635 MRP/MSL 75-6(TR). Owens, D.R. "Mineralogical investigation of a gold-bearing jig concentrate on behalf of Dome Mines Limited"

636 MRP/MSL 75-8(IR). Raicevic, D. "Evaluation of processes for recovery of chromium from Bird River chromite deposits"

637 MRP/MSL 75-11(IR). Mathieu, G.I. and Bruce, R.W. "Comparison of high-intensity magnetic separators for recovery of iron-bearing spodumene from tailings of a former lithium producer, Abitibi-East, Quebec"

638 MRP/MSL 75-12(IR). Kaiman, S. "Zyglo test on a radioactive pegmatite ore from Bancroft, Ontario"

639 MRP/MSL 76-1(IR). Mathieu, G.I., Berry, T.F. and Bruce, R.W. "Recovery of tungsten, molybdenum and bismuth minerals from the Brunswick Tin Mines property in southwestern New Brunswick"

640 (IR) 76-5. McNamara, V.M. "Cyanide pollution abatement project - The treatment of Canadian gold mill filter-press barrens - A status report"

641 MRP/MSL 76-6(TR). Owens, D. "Mineralogical and electron microprobe studies of leached residues resulting from hydrometallurgical tests on a roasted titaniferous magnetite concentrate"

642 MRP/MSL 76-8(IR). Ritcey, G.M. and Lucas, B.H. "Treatment of mingan titaniferous magnetite for the separation and recovery of chromium, vandium and aluminum by roast-leach-solvent extraction"

643 MRP/MSL 76-9(FT). Berry, E.E. "Visit to fly ash producers and users in Alberta and Saskatchewan"

644 MRP/MSL 76-11(IR). Klymowsky, I.B. "The flotation of Peace River iron ore"

645 MRP/MSL 76-12(IR). Wall, W.A. "Investigation of Peace River ore by tabling and magnetic separation"

646 MRP/MSL 76-15(C). Buchanan, R.M. "The 78th Annual General Meeting of the Canadian Institute of Mining and Metallurgy, Quebec, P.Q., April 25-29, 1976"

647 MRP/MSL 76-18(TR). Prud'Homme, P. "Mineral wool production from steel slag"

648 IR 76-1. Gilmore, A.J. "The removal of cyanide and metal-cyanide complexes from cyanidation wastes by fixed-bed ion-exchange technology"

649 MRP/MSL 76-20(IR). Kaiman, S. and Petruk, W. "Mineralogical investigation of ore from the Santa Lucia Zn-Pb deposit, Cuba"

650 MRP/MSL 76-21(TR). Malhotra, V.M. "A case for the Mineral Sciences Laboratories, CANMET"

651 MRP/MSL 76-22(IR). Winer, A.A. "A study of steel slag material for mineral wool manufacture"

652 MRP/MSL 76-25(TR). Berry, T.F. "Discussions concerning the feasibility of processing the ore from Brunwick Tin Mines Ltd. Meeting held in the offices of Sullivan Mining Group Ltd., Montreal, Aug. 26-27, 1976"

653 MRP/MSL 76-26(IR). Gilmore, A.J. "The ion-exchange removal of cyanide from gold-mill wastes for environmental benefit"

654 MRP/MSL 76-27(IR). Berry, T.F. "Upgrading a concentrate from the Brunswick Tin Mines property, southwestern New Brunswick"

655 MRP/MSL 76-28(IR). Petruk, W. and Pinard, R.G. "Image analysis study and evaluation of hematite in tailings from the Mount Weight Concentration, Quebec Cartier Mining Company"

656 MRP/MSL 76-29(IR). Petruk, W., Pinard, R.G. and Owens, D.R. "Image analysis and mineralogical evaluation of ore and mill products from Brouillan Township, Quebec for Selco Mines Limited"

657 MRP/MSL 76-30(IR). Green, D.J. and Wheat, T.A. "Synthesis of beta"-alumina using a freeze-dry technique"

658 MRP/MSL 76-31(TR). Bell, K.E. "Pyrometric cone equivalents of samples submitted by Quebec Iron and Titanium Corporation, Sorel, P.Q."

659 IR 77-5. Craigen, W.J.S. and Kelly, F.J. "Economic evaluation of cyanide removal processes"

660 IR 77-15. Ritcey, G.M. "Treatment of gold mill effluents for removal and recovery or destruction of cyanide - A summary of the joint project with six gold mills"

661 ERP/MSL 77-36(IR). Skeaff, J.M. "Survey of the occurrence of Ra-226 in the Rio Algom Quirke I Uranium Mill, Elliot Lake"

662 MRP/MSL 78-7(IR). Collings, R.K. and Brown, G.A. "Evaluation of fluorogypsum for gypsum products manufacture"

ENERGY RESEARCH LABORATORIES

663 ERP/ERL 81-04. Prokopuk, R., Lee, G.K., Banks, G.N. and Whaley, H. "Sulphur oxide neutralization with limestone during combustion of SUNCOR coke"

664 ERP/ERL 81-11. Jorgensen, J.G., Lloyd, T.A. and Fung, A.B. "An investigation of the caking and coking properties of a coal sample from mine 9A-H, Smoky River property, submitted by McIntyre Mines Limited"

665 ERP/ERL 81-16. Whaley, H., Prokopuk, R., Banks, G.N. and Lee, G.K. "Pilot-scale evaluation of flame stability and heat transfer characteristics of milled wood shavings"

666 ERP/ERL 81-17. Lee, G.K., Prokopuk, R., Whaley, H. and Banks, G.N. "Combustion trials with Sage Creek coal Phase I - Preliminary assessment of a 65:35 blend of a No. 4 upper and No. 4 lower seams in a pilot-scale utility boiler"

667 ERP/ERL 81-18. Jorgensen, J.G., Lloyd, T.A. and Fung, A.B. "An investigation of the caking and coking characteristics of a coal sample from seam No. 2, North Hill, Sage Creek submitted by Techman Ltd."

668 ERP/ERL 81-47. Banks, G.N., Prokopuk, R., Whaley, H. and Lee, G.K. "Combustion evaluation of Quintette coal in a pilot-scale utility boiler"

PHYSICAL METALLURGY RESEARCH LABORATORIES

669 MRP/PMRL 78-39. Warda, R.D. "Measurement of particulate emissions from the Prasco high-temperature emission control (HITEC) system at Thor-Foundry, Winnipeg"

670 MRP/PMRL 79-11. Trudeau, L.P. "Viewing of fractured tanker "Kurdistan" in St. John, N.B. 16-17 April, 1979"

671 MRP/PMRL 79-37. Gilmour, J.B. and Blouin, A. "Examination of a corroded Keel Cooler"

672 ERP/PMRL 81-6. Brigham, R.J. "Investigation of the Kars chimney failure"

SECTION 6

CONTRACT RESEARCH REPORTS

The reports listed below are available for purchase in microfiche or paper copy from Micromedia Limited, Box 502, Station S, Toronto, Canada, M5M 4L8.

673 "Fording coal - B seam"; Warnock Hersey Professional Services Ltd.
Contract ISQ78-00048 - 15 p

674 "Greenhills adit 21 seam 1 - 79 - 7043 DA 7 & WA7"; Warnock Hersey Professional Services Ltd.
Contract 1SQ78 - 5 p

675 "Screen & sink - float analysis before attrition; screen & sink - float analysis after attrition (dry 7 minutes). Screen analysis after attrition (wet 7 minutes); screen analysis after attrition (dry 15 minutes); screen analysis after attrition (dry 15 minutes); screen analysis after attrition (wet 15 minutes)"; Warnock Hersey Professional Services Ltd.
Contract 1SQ78-00048 - 14 p

676 "A methodology for an integrated analysis of the materials-related aspects of reliability in load-bearing components of large scale engineering structures - Final report"; Hay, Robert D., Rodriguez III, E.S. and Puglisi, F.
Contract ISQ78-00115 - 47 p

677 "Atmospheric fluid bed combustor - Burning washery rejects"; Luscar Ltd.
Contract 1SQ79-00170 - 119 p

678 "A study of the suitability of British Columbia and Nova Scotia coal resources for underground gasification - Phase 1 - Underground coal gasification technology and site selection criteria"; B.H. Lewelton & Assoc. Ltd.
Contract 1SQ80-00057 - 143 p

679 "A study of the suitability of British Columbia and Nova Scotia coal resources for underground gasification - Phase 2 - Evaluation of the suitability of British Columbia and Nova Scotia coal resources"; B.H. Lewelton & Assoc. Ltd.
Contract 1SQ80-00057 - 143 p

680 "A study of the suitability of British Columbia and Nova Scotia coal resources for underground gasification - Phase 2 - Evaluation of the suitability of British Columbia and Nova Scotia coal resources - Appendix A-1 - Coal resources of British Columbia"; Dolmage Campbell & Assoc. (1975) Ltd.
Contract 1SQ80-00057-157 p

681 "A study of the suitability of British Columbia and Nova Scotia coal resources for underground gasification - Phase 2 - Evaluation of the suitability of British Columbia and Nova Scotia coal resources - Appendix B"; B.H. Lewelton & Assoc. Ltd. and Brown, Erdman & Assoc.
Contract 1SQ80-00057 - 139 p

682 "Determination of rheological properties of coal-oil slurries - Final report"; Gillies, R.
Contract OSQ77-00263 - 102 p

683 "Development, installation and operation of a subsidence monitoring and telemetry system - Final report"; Ecological and Resources Consultants Limited
Contract OSQ78-00238-158 p

684 "Fluidized bed pilot plant program examining combustion of coal and coal/wood mixtures - Final report"; Foster Wheeler Development Corporation
Contract OSQ79-00074 - 180 p

685 "Bench scale evaluation and economic assessment of ion exchange resins for the removal of radionuclides from uranium mill tailings effluents"; Eldorado Nuclear Limited
Contract OSQ79-00123 - 47 p

686 "Development of abrasion resistant ceramics - Final report"; Ontario Research Foundation
Contract OSQ79-00140 - 48 p

687 "Optimization, chemistry and product analysis of supercritical gas extraction techniques for the liquefaction of Canadian coals - Final report"; Raylo Chemicals Limited
Contract OSQ80-00011 - 80 p

688 "A Computer system to assist in the design of mine layouts (MINLAY)"; Noranda Mines Limited
Contract OSQ80-00042 - 138 p

689 "State-of-the-art review of automatic processes for the butt welding of large diameter pipelines - Final report"; Itres Research Limited
Contract OSQ80-00058 - 92 p

690 "Chemical characterization of pitch - Final report"; Sandwell Beak Research Group
Contract OSQ80-00068 - 44 p

691 "A review of underground coal mine dust control in the United Kingdom, West Germany, France, the United States and Canada - Final report"; Brian Mountford & Assoc. Ltd.
Contract OSQ80-00090 - 182 p

692 "Economic evaluation of preconcentration of uranium ores - Final report"; Lummus, Minerals Division
Contract OSQ80-00120 - 66 p

693 "Saarberg-Hoelter FGD process cost estimate - Final report"; Acres Davy McKee Ltd.
Contract OSQ80-00129 - 236 p

694 "Evaluation of the crevice corrosion susceptibility of stainless steel - Final report"; Dearborn Environmental Consulting Services
Contract OSQ80-00157 - 23 p

695 "The Methodology of the thermomechanical analysis of welded joints - Final report"; R.J. Pick Ltd.
Contract OSQ80-00165 - 89 p

696 "Development of non-leaded free-machining steels - Phase 1 - Final report"; McMaster Univ.
Contract OSU80-0011 - 83 p

697 "A Study on modelling methodology illustrating principles and benefits in mineral and energy processing plants - Final report"; McGill Univ.
Contract OSU80-00031 - 177 p

698 "Transmission electron microscopy of niobium and vanadium carbonitride precipitates in low-alloy eutectoid steels for premium rail - Final report"; Tech Univ. Nova Scotia
Contract OSU80-00060 - 52 p

699 "Sampling of mineral and coal slurries - Final report"; Smith, H.W.
Contract OSU80-00065 - 82 p

700 "Identification of precipitate phases in microalloyed steels by STEM - Final report"; McMaster Univ.
Contract OSU80-00067 - 22 p

701 "Fortran models of comminution and flotation equipment in mineral processing - Final report"; Univ. British Columbia
Contract OSU80-00108 - 130 p

702 "Preparation and development of semiconducting TiO_2 films for photoelectrolysis of water - Final report"; Brock Univ.
Contract OSU80-00112 - 32 p

703 "Development of transition metal semiconductors for photoelectrolysis of water - Final report"; Dignam, M.H. and Weber, M.F.
Contract OSU80-00154 - 35 p

704 "Modelling of ignition and buildup to detonation in slurry explosives - Phase II"; Univ. Ottawa
Contract OSU80-00204 - 147 p

705 "A study on the copper catalysed air oxidation of thiosalts - Final report"; Univ. Waterloo
Contract OSU80-00272 - 38 p

706 "Comparison of selected gasification processes"; Ebastec Lavalin Inc.
Contract OSQ79-00209 - 69 p

707 "Feasibility study: Fourier transform infrared spectroscopy and photoacoustic spectroscopy in determination of bulk and surface oxidation of coals - Final report"; St. Francis Xavier Univ.
Contract OSU80-00225 - 174 p

708 "Assessment of Canadian peat as an alternative fuel for power generation"; Montreal Engineering Company Limited
Contract 1SQ76-00128 - 232 p

709 "Bench scale testing program on coal cleaning by chemical comminution - Final report"; Catalytic Enterprises Ltd.
Contract 1SQ79-00101 - 128 p

710 "A project to develop a thermodynamic ventilation network computer program for deep Canadian mines"; Univ. of British Columbia
Contract OEZ80-05071 - 159 p

711 "Determination of rheological properties of coal-oil slurries - Final report"; Gillies, R.
Contract OSQ77-00263 - 102 p

712 "Coal liquefaction by concurrent grinding and hydrogenation"; British Columbia Research
Contract OSQ78-00010 - 86 p

713 "SF_6 Ventilation study at Agnew Lake Mines, Ontario"; James F. MacLaren Limited
Contract OSQ78-00093 - 119 p

714 "Shaunavon Coal Utilization Study - Phase II - Volume 1 - Executive summary"; Saskmont Engineering Co. Ltd.
Contract OSQ78-00110 - 15 p

715 "Shaunavon Coal Utilization Study - Phase II - Volume II - Main report"; Saskmont Engineering Co. Ltd.
Contract OSQ78-00110 - 256 p

716 "Low severity coal liquefaction process - Final report"; Nova Scotia Research Foundation Corporation
Contract OSQ78-0104 - 83 p

717 "CANMET products - Semi-detailed assay - Final report"; Gulf Canada Limited
Contract OSQ79-00024 - 15 p

718 "Capital and operating cost estimates uranium mining - Final report"; Wright Engineers Ltd.
Contract OSQ79-00028 - 14 p

719 "Design, development, and initial testing of the heato drill"; Lockhead Haggerty Engineering & Manufacturing Co. Limited.
Contract OSQ78-00126 - 27 p

720 "Coal agglomeration and coal-oil mixture combustion in a utility boiler - Phase III - Final report"; New Brunswick Electric Power Commision
Contract OSQ79-00054 - 115 p

721 "Development of low BTU gas burner for industrial application - Phase III - Final report"; Canadian Gas Research Institute
Contract OSQ79-00194 - 51 p

722 "Soil corrosion in Canada current status - Final report"; J.D. Palmer Associates Engineering Ltd.
Contract OSQ80-00012 - 53 p

723 "Ozone emissions from GMA welding of copper-nickel alloys"; Welding Inst of Canada
Contract OSQ80-00020 - 75 p

724 "Diesel exhaust cooler development - Final report"; Hovey & Associates (1979) Ltd.
Contract OSQ80-00028 - 42 p

725 "Evaluation of chlorine/chloride based processes for uranium ores - Final report"; Lummus, Minerals Division
Contract OSQ80-00030 - 41 p

726 "Prediction of stable excavation spans for mining at depths below 1000 meters in hard rock"; Golder Associates
Contract OSQ80-00081 - 134 p

727 "Asbestos: definitions, monitoring and measurement in the workplace - Final report"; Ontario Research Foundation
Contract OSQ80-00192 - 36 p

728 "Prototype design of a flameproof exhaust system for diesel engines used in underground coal mines"; Univ. British Columbia
Contract OSU79-00067 - 43 p

729 "The effect of vibration upon workers in the mining industry - A preliminary report"; Univ. of British Columbia
Contract OSU79-00145 - 69 p

730 "Investigation of coal liquefaction processes - Final report"; Industrial Research McGill
Contract OSU79-00193 - 42 p

731 "Degradation of coke in the blast furnace - Final report"; McMaster Univ.
Contract OSU79-00271 - 18 p

732 "De-emulsification and microbes - Part 2"; Univ. of Western Ontario
Contract OSU80-00017 - 68 p

733 "Material and design for resistance to crack growth by creep - Phase I - Final report"; McMaster Univ.
Contract OSU80-00107 - 45 p

734 "An investigation of the short residence time pyrolysis of coal - Final report"; Univ. of Waterloo
Contract OSU79-00190 - 160 p

735 "Asbestos fibre monitor"; Metrex Instruments Limited
Contract OSQ79-00088 - 81 p

736 "Ignition of methane atmospheres and/or coal dust layers by components of mobile diesel powered equipment which are subject to frictional or impact heating"; Univ. of British Columbia
Contract OSU79-00069 - 48 p

SECTION 7

RESEARCH AGREEMENT PROGRAM REPORTS

The reports listed below are NOT available from CANMET. Copies should be requested from the authors at their respective institutional addresses.

737 Mantel, J.H. and Archibald, J.F. "Determination of relaxation length in materials associated with uranium mining" Kingston, Queen's University, Department of Mining and Engineering, February 1982
Agreement 15-2-81 - 53 p

738 Gendzwill, D.J., Horner, R.B. and Hasegawa, H.S. "Induced earthquakes at a potash mine near Saskatoon, Canada" Saskatoon, University of Saskatchewan, Department of Geology, 1981
Agreement 114-2-81

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The opinion of concerned readers may influence the direction of future CANMET research.

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Is it useful?	Yes_____	No_____
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CANMET

Canada Centre for Mineral and Energy Technology

Centre canadien de la technologie des minéraux et de l'énergie

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DIVISION DE L'INFORMATION TECHNOLOGIQUE

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DIVISION DE L'INFORMATION TECHNOLOGIQUE

RAPPORT DE CANMET 82-10F juillet 1982

AVANT-PROPOS

Cette publication contient la liste exhaustive des divers rapports rédigés par les spécialistes et le personnel de recherche de CANMET, publiés en 1981-1982. On y trouve aussi les rapports de recherche composés par des organismes externes embauchés à contrat.

La section 1 fournit les titres et les résumés des rapports préparés pour la série "Rapports de CANMET". Ceux-ci sont principalement fondés sur la recherche fondamentale et appliquée menée par CANMET, ou pour son compte, et sont destinés à la vente ou à la distribution générale.

La section 2 procure la liste des titres et des résumés de rapports destinés à être soumis à des revues et publiés par la suite dans des revues ou des périodiques externes.

La section 3 contient les titres et les résumés des documents composés en vue d'une présentation orale lors de conférences et de colloques tenus à l'extérieur ou, dans certains cas, pour des publications en cours.

La section 4 donne la liste des enquêtes des divisions et des rapports techniques, aussi bien que des études des publications. Les rapports d'enquête décrivent l'application des procédures établies à des problèmes soumis par des personnes, des entreprises et des organismes extérieurs à CANMET. Les rapports techniques présentent les résultats d'une série de déterminations analytiques, de méthodes d'essais, etc., accompagnés des interprétations et des conclusions.

La section 5 présente la liste des enquêtes de divisions et des rapports techniques déclassifiés décrits ci-dessus.

La section 6 contient les titres des rapports préparés par des organismes de recherche privés à contrat avec CANMET, décrivant les études faites sur les ressources minérales nationales, l'approvisionnement en énergie et la technologie énergétique.

La Section 7 comprend les rapports exposant les recherches menées par les organismes externes avec l'appui financier de CANMET.

James E. Kanasy
Chef
Division de l'information
technologique

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SECTION 1

RAPPORTS DE CANMET

Les rapports suivants sont disponibles aux prix indiqués en s'adressant soit à la Direction de l'Imprimerie et de l'Édition, Approvisionnements et Services Canada, Québec, K1A 0S9, soit à la Section des ventes et de la distribution des publications du CANMET, Énergie, Mines et Ressources, Canada, 555, rue Booth, Ottawa, K1A 0G1. On peut se procurer des copies sur microfiches en s'adressant à Micromedia Limited, C.P. 502, succursale S, Toronto, Canada, M5M 4L8.

001 Monographie 881. (Seconde édition). Donaldson, Elsie M. "Methods for the analysis of ores, rocks and related materials"
No. cat. M32-881/1982E - 569 p.
Canada 28,00 $; autres pays 33,60 $

Cette monographie présente de nouvelles méthodes expérimentales basées sur des techniques comme la spectrophotométrie d'absorption lumineuse, la polarographie, la potentiométrie, la fluorométrie, la spectrophotométrie d'émission de flamme et d'absorption atomique. Ces méthodes ont été mises au point à CANMET afin de procéder à des analyses dans le domaine de la recherche métallurgique et autres sujets expérimentaux. Ce document a été établi à titre de manuel et de référence pour les chimistes et les spécialistes du gouvernement, de l'industrie et des autres organismes.

002 Rapport de CANMET 80-4E. Gransden, J.F., Price, J.T. et Leeder, W.R. "Coke-making with Canadian medium and high volatile commercial coking coals"
No. cat. M38-13/80-4E - 29 p.
Canada 2,25 $; autres pays 2,70 $

Ce document fait état de l'étude de la qualité du coke obtenu à partir des charbons cokéfiant de l'ouest ainsi que de mélanges de charbons cokéfiants de l'est et de l'ouest du Canada. En mélangeant des charbons de l'Est à faible teneur en cendre et à forte teneur en soufre avec des charbons à forte teneur en cendre et faible teneur en soufre, on a obtenu des cokes dont les propriétés chimiques et physiques conviennent à l'utilisation dans les hauts-fourneaux. Les facteurs de stabilité mesurés ont été comparés à ceux que l'on a établis en fonction des propriétés des charbons par application de trois méthodes. La méthode pétrographique a donné des prévisions précises de la résistance des charbons cokéfiés individuellement, mais de moins bons résultats pour les mélanges de charbon. La méthode du facteur G a donné des résultats assez précis pour tous les charbons et les mélanges, à l'exception du charbon de l'est canadien. La troisième méthode, la plus précise, a mis en application une relation entre la résistance du coke, le pouvoir réflecteur moyen maximal de la vitrinite et la fluidité Gieseler maximale obtenue par le traitement des données de CANMET sur 80 charbons de l'ouest.

003 Rapport de CANMET 80-20E. Kirk, B. "An iris diaphragm-based interface for use in eriometry"
No. cat. M38-13/80-20E - 21 p.
Canada 2,50 $; autres pays 3,00 $

L'ériométrie, c'est-à-dire l'évaluation de la répartition dimensionnelle d'un ensemble de fines particules à partir de leur schéma de diffraction de groupe, a montré d'importantes possibilités d'application industrielle. Ce rapport présente une méthode nouvelle et peu coûteuse d'accouplement de l'ériomètre à un mini-ordinateur. L'application de l'analyse ériométrique à des fines particules de silice dont la gamme des dimensions était couverte adéquatement par le système, a donné des résultats en bonne concordance avec ceux de l'analyse microscopique.

004 Rapport de CANMET 80-27E. Knight, G. "Generation and control of mine airborne dust"
No. cat. M38-13/80-27E - 20 p.
Canada 2,10 $; autres pays 2,50 $

On y présente une étude destinée à déterminer les sources de poussière en suspension dans l'air dans les mines et à faire des recherches sur les méthodes de contrôle. Les mesures correspondantes effectuées dans six mines sont données dans le cas d'opérations de sautage, de chargement, de transport et de déchargement de roches, de forage et de travaux auxiliaires. Les résultats ont indiqué que le sautage, le broyage et les cheminées à minerai verticales produisent le plus de poussière. Suivent des recommandations relatives à l'élimination des poussières dans les mines de roches dures.

005 Rapport de CANMET 81-1E. Steger, H.F. et Bowman, W.S. "Niobium ore OKA-1-A certified reference material"
No cat. M38-13/81-1E - 14 p.
Canada 1,75 $; autres pays 2,10 $

Un minerai de niobium, BL-5 a été préparé à titre de matériau de référence de composition. Vingt-deux laboratoires ont contribué au déroulement d'un programme d'analyses dont la compilation statistique a donné comme résultat une valeur recommandée de 0,37 ± 0,01%.

006 Rapport de CANMET 81-2E. Hamer, C. "Acid extraction of alumina from Canadian non-bauxite sources at CANMET"
No Cat. M38-13/81-2E - 14 p.
Canada 2,00 $; autres pays 2,40 $

Ce rapport présente les travaux des laboratoires de CANMET sur les méthodes de récupération de l'alumine par extraction aux acides à partir des sources canadiennes autres que la bauxite. Les matériaux à l'étude sont l'anorthosite, les argiles et les déchets de charbon. Les techniques utilisées sont l'extraction à l'acide chlorhydrique et la méthode H Plus, car elles sont considérées comme les technqiues les plus perfectionnées de récupération de l'alumine. Bien que ce travail se soit déroulé à l'échelle du laboratoire, on a pu constater la possibilité d'extraire l'aluminium à partir de l'anorthosite, des argiles et de la cendre en couche fluidisée d'origine canadienne et que l'on pouvait obtenir de l'alumine de qualité de pile. Les calculs effectués montrent que toutes ces méthodes coûtent légèrement plus cher sur le plan des investissements et des frais d'exploitation que la méthode Bayer utilisant de la bauxite.

007 Rapport de CANMET 81-3E. Mikhail, M.W., Bird, L.C. et Landgren, N.I.T. "Feasibility study on recovery of thermal coal from waste dumps in Nova Scotia"
No cat. M38-13/81-3E - 29 p.
Canada 3,75 $; autres pays 4,50 $

Un programme a été mis sur pied en 1972 afin de procéder à la récupération de charbon commercialisable à partir des terrils voisins de l'usine de lavage d'Acadia à Stellarton, Nouvelle-Écosse. À la fin de 1979, un total de 738 202 t de matériaux de ces terrils avaient été traitées, permettant la production de 205 212 t de charbon pour la production d'électricité et utilisation domestique en Nouvelle-Écosse. Le présent document présente brièvement l'usine de Stellarton ainsi qu'une évaluation des caractéristiques de lavabilité des matériaux des terrils de Westville en fonction du texte dans son ensemble. On trouve ensuite diverses options ralatives à la conception de l'usine de récupération de charbon thermique à partir des terrils de Westville, ainsi que la possibilité d'étendre le programme à d'autres terrils en Nouvelle-Écosse.

008 Rapport de CANMET 81-4E. Hardin, A.H. Ternan, M. et Packwood, R.H. "The effects of pore size in MoO_3-CoO-Al_2O_3 hydrocracking catalysts"
No cat. M38-13/81-4E - 36 p.
Canada 3,75 $; autres pays 4,50 $

Ce document présente la détermination de l'effet des variations du diamètre moyen des pores dans le cas de quatre séries de catalyseurs, sur les réactions d'hydrodésulfurisation, d'hydrodéazotation et de conversion du bitume de l'Athabasca. Des essais classiques ont été effectués sur un blanc d'alumine et trois séries de catalyseurs au cobalt/molybdène/alumine de composition respective: 1,1:2,2, 4,4:8,8 et 3,0:1,0 m% CoO:MnO_3. Les répartitions moyennes des diamètres des pores, déterminées par pénétration de Hg, donnent des valeurs comprises entre 7,0 et 100,0 nm. Les volumes des pores varient entre 0,25 et 0,65 mLg^{-1}. Les superficies varient de 1 à 200 m^2g^{-1}. Les analyses effectuées

à la microsonde électronique indiquent des variations distinctes des répartitions radiales de Fe, Ni, V et S au sein des catalyseurs. On obtient des maximums pour le pourcentage de masse de l'élimination des soufres dans le cas des pores voisins de 15 nm pour deux catalyseurs. De plus, les taux par unité de superficie pour l'élimination de S et N augmentent en même temps que le diamètre moyen des pores jusqu'à environ 50 nm, puis ils demeurent constants.

009 Rapport de CANMET 81-5E. Beshai, J.E. et George, A.E. "High performance liquid chromatographic HPLC method for type analysis of hydrocarbons in synthetic fuel naphtha"
No cat. M38-13/81-5E - 6p.
Canada 1,50 $; autres pays 1,80 $

Ce rapport décrit une méthode de détermination des teneurs en oléfine, produits de saturation et produits aromatiques d'essence lourde synthétique, à l'aide d'un système HPLC mis au point dans le laboratoire de recherche sur les combustibles synthétiques de CANMET. Chaque analyse dure environ 20 minutes et doit répondre à quatre exigences fondamentales: détermination rapide; reproductibilité des résultats; exposition minimale des échantillons à la chaleur, à l'air et à la lumière pour éviter les modifications chimiques; et inaltération chimique des concentrés de la classe des hydrocarbures séparés. Un mélange type d'hydrocarbures et trois fractions d'essence lourde synthétique sont analysés et les résultats sont comparés aux analyses FIA.

010 Rapport de CANMET 81-7E. Steger, H.F. et Bowman, W.S. "PD-1: A certified non-ferrous reference dust"
No cat. M38-13/81-7E - 17 p.
Canada 2,00 $; autres pays 2,40 $

Un échantillon de 165 kg de poussière ferreuse, PD-1, provenant de la fonderie de zinc-cuivre d'Hudson Bay Mining and Smelting Company Limited, à Flin Flon, Manitoba, est préparé à titre de matériau de référence de composition. Après l'avoir broyé à - 74 µm, il est mélangé en un lot et l'on vérifie son homogénéité par méthodes chimiques avant et après la mise en bouteille en unités de 200 g. Vingt-six laboratoires participent ensuite à un programme d'analyse de l'un ou de plusieurs des éléments suivants: plomb, arsenic et mercure, dans une bouteille de PD-1. On obtient les valeurs recommandées suivantes: Pb, 2,75%; As, 0,77%; Hg 389 µg/g.

011 Rapport de CANMET 81-8E. Jambor, J.L. "Mineralogy of the Caribou massive sulphide deposit"
No cat. M38-13/81-8E - 65 p.
Canada 4,75 $; autres pays 5,70 $

Ce rapport donne les résultats d'une étude de la répartition et des sources minières de l'argent dans le gisement de sulfures massifs Caribou, dans le nord du Nouveau-Brunswick. On y trouve aussi les résultats d'une étude plus complète du minerai, ce qui donne une documentation de base des types de minerai et des caractéristiques texturales typiques des sulfures massifs de Caribou.

012 Rapport de CANMET 81-9E. Collings, R.K. "Mineral waste resources of Canada Report No. 5 - Mining wastes in the Prairie Provinces"
No cat. M38-13/81-9E - 21 p.
Canada 2,50 $; autres pays 3,00 $

Ce rapport fournit des informations de base sur les stériles et les résidus de traitement dans les provinces des Prairies où l'on produit chaque année plus de 90 x 10^6 t de ces déchets. Les données relatives à la présence, à la minéralogie, à la pétrographie et aux caractéristiques physiques et chimiques de stériles de 21 mines en exploitation sont fournies dans le cas de quatre types principaux de mines: métaux, uranium, minéraux non métalliques ou industriels, et charbon. On y donne les utilisations possibles et on indique les recherches correspondantes.

013 Rapport de CANMET 81-10E. "Revue de CANMET 1980-81"
No cat. M38-13/81-10E - 62 p.
Canada 5,00 $; autres pays 6,00 $

Le ministère fédéral de l'Énergie, des Mines et des Ressources recherche l'utilisation efficace des ressources énergétiques et minérales du Canada en déterminant le potentiel des ressources naturelles du pays, améliorant la technologie de leur exploitation, évaluant les facteurs économiques et sociaux, formulant et appliquant des politiques, et procédant au transfert des nouvelles technologies aux gouvernements, à l'industrie et au public. Le rapport décrit la contribution du Centre canadien de la technologie des minéraux et de l'énergie (CANMET) aux objectifs décrits ci-dessus.

014 Rapport de CANMET 81-11E. Steger, H.F., Bowman, W.S. et Zechanowitsch, G. "DH-1a: A certified uranium-thorium reference ore"
No cat. M38-13/81-11E - 14 p.
Canada 2,00 $; autres pays 2,40 $

Un échantillon de 122 kg de minerai d'uranium-thorium, DH-1a, provenant d'Elliot Lake en Ontario, a été préparé comme matériau de référence de composition pour remplacer le minerai certifié analogue, DH-1, dont l'inventaire était épuisé. Cet échantillon a été broyé à moins 74 µm, mélangé en un lot et mis en bouteille dans des unités de 200 g. L'homogénéité de DH-1a relative à l'uranium a été confirmée à CANMET après application de la méthode d'arbitrage volumétrique. La valeur recommandée pour l'uranium est basée sur les données extraites de la confirmation d'homogénéité. Dans le cas du thorium, 12 laboratoires ont participé au programme d'analyse. Une analyse statistique des données indique une valeur recommandée de 0,263% pour l'uranium, et 0,091% pour le thorium.

015 Rapport de CANMET 81-13E. Steger, H.F. et Bowman, W.S. "MA-2: A certified gold reference ore"
No cat. M38-13/81-13E - 12 p.
Canada 2,50 $; autres pays 3,00 $

Un minerai d'or, MA-2, provenant de Kirkland Lake en Ontario, a été préparé comme matériau de référence de composition. Vingt-deux laboratoires ont participé à un programme d'analyse; l'analyse statistique des données indique une valeur recommandée de 1,86 µg/g.

016 Rapport de CANMET 81-15E. Wilson, H.S. "Lightweight aggregates-vermiculite, perlite pumice - for insulating concretes"
No cat. M38-13/81-15E - 28 p.
Canada 3,50 $; autres pays 4,20 $

Ce rapport traite des aggrégats légers produits à partir de vermiculite, perlite et pierre-ponce et utilisés dans la fabrication des bétons et des plastiques non chargés et d'isolation. On y traite de leur minéralogie et géologie, de la répartition des gisements dans le monde, de leurs extraction et traitement, ainsi, que de leurs propriétés et applications en construction et dans d'autres domaines. On y traite aussi des spécifications relatives au plâtre à béton et à d'autres applications dans le domaine de la construction.

017 Rapport de CANMET 81-16F. Metz, J.L. "Catalogue des publications de CANMET 1980-1981"
No cat. M38-13/81-16F - 43 p.
Canada 5,00 $; autres pays 6,00 $

Ce catalogue est une compilation des rapports préparés par le personnel scientifique et technique de CANMET en 1980-81, et parfois avant, ainsi que des rapports de recherche préparés à contrat par des organismes externes.

018 Rapport de CANMET 81-17E. Collings, R.K. et Wang, S.S.B. "Mineral waste resources of Canada Report no 8 - Non-ferrous metallurgical wastes"
No cat. M38-13/81-17E - 11 p.
Canada 2,25 $; autres pays 2,70 $

Les industries canadiennes d'exploitation minière, de traitement des minéraux, de métallurgie et de chimie produisent environ 700 x 10^6 t/a de résidus solides minéraux et à base de minéraux dont 4 x 10^6 proviennent de l'exploitation de minerais non ferreux. Ce rapport fournit des informations techniques sur les résidus métallurgiques non ferreux en fonction du type, de la quantité produite, des caractéristiques physiques, des analyses chimiques. On y traite aussi des utilisations actuelles et possibles des lairiers de cuivre, de nickel et de plomb.

019 Rapport de CANMET 82-2E. Wilson, M.F. "Impact of excessive aromatics in oil sand syncrudes on production and quality of middle distillate fuels"
No cat. M38-13/82-2E - 25 p.
Canada 2,75 $; autres pays 3,30 $

Les deux prochaines décennies devraient voir augmenter l'exploitation des sables bitumineux et des gisements de brut lourd au Canada. Les méthodes actuelles d'enrichissement du bitume de l'Athabasca produisent des bruts synthétiques dont la teneur en produits aromatiques est si élevée que les carburants pour moteurs diesel et réacteurs produits à partir des distillats de sable bitumineux ne répondent pas aux normes actuelles. On prévoit que l'augmentation de la demande de ces combustibles fera pression sur les raffineries et menacera la qualité des futurs produits combustibles. Ce rapport procède à l'examen des conséquences de ces développements et étudie des solutions possibles.

SECTION 2

PÉRIODIQUES

On peut se procurer ces documents dans les périodiques ou procès-verbaux mentionnés, ou en s'adressant directement à l'auteur.

LABORATOIRES DES SCIENCES MINÉRALES

020 Ahmed, S.M. "Surface chemistry of chrysotile asbestos"; Proc Symp "Asbestos from aqueous solutions"; ACS, Plenum Press; 213-226; 1981.

Examen de l'interface d'une solution aqueuse-chrysotile par mesure du zpc, des densités de charge de surface et du potential zeta, par titrage potentiométrique du pH et électrophorèse. Les résultats montrent que les ions silicate sont facilement asborbés par la chrysotile, amenant la zpc à un pH inférieur; ils font aussi fonction d'activiteurs anioniques pour l'adsorption d'amines cationiques à chaîne longue. Les ions silicate peuvent aussi protéger la surface des attaques par l'acide dans des solutions légèrement acides.

021 Berry, E.E. "Preparation and properties of sulphur-infiltrated autoclaved concrete"; Cement and Concrete Research 9:667-676; 1979.

Des échantillons de béton traités en autoclave ont été infiltrés par du soufre liquide à 150°C. Le taux d'infiltration du soufre, les propriétés mécaniques et la durabilité des échantillons infiltrés sont fortement fonction de la nature de la porosité des bétons initiaux non infiltrés. La répartition dimensionnelle des pores des échantillons est fonction du rapport CaO/SiO_2 (mole) du liant.

022 Berry, E.E. "Strength development of some blended-cement mortars"; Cement and Concrete Research 10:1-11; 1980.

Ce rapport étudie l'évolution de la résistance à la compression des mortiers préparés à partir de mélanges de scories, de cendre volante et de ciment de Portland. Aucune interaction apparente n'a été trouvée entre des scories granulées et la cendre volante utilisées ensemble. Un examen des effets de l'ajout de matériaux de cémentation sur l'air emprisonné montre que l'un des échantillons de cendre volante a provoqué une réduction importante de l'air dans les mortiers frais non entraînés par l'air. On a procédé à une modification de l'équation de Feret pour évaluer la contribution de cette cendre volante à l'activité de cémentation dans les débuts.

023 Berry, E.E. et Malhotra, V.M. "Reply to discussions of a paper by E.E. Berry and V.M. Malhotra Fly ash for use in concrete - A critical review"; ACIJ Disc. 77-8 p. 59; 1980.

Présentation de l'étude relative aux documents ci-dessus.

024 Cabri, L.J., Laflamme, J.H.G. and Harris, D.C. "Mineralogical study of complex Pt-Fe nuggets"; Bull. Soc Mineral Crystallogr 104:508-525; 1981.

Les pépites de Pt-Fe éluviales enrobées de goethite, et alluviales d'allure fraîche provenant du courant Joubdo, dans la rivière Birbir, présentent une morphologie externe très variable, allant de l'aspect arrondi, aplati à des projections irrégulières très pointues. Un microscope à balayage électronique révèle des détails cristallins des alliages de Pt-Fe à des niveaux non notés précédemment. D'autres minéraux non nommés sont aussi mentionnés pour la première fois.

025 Chen, T.T. et Szymanski, J.R. "The structure and chemistry of galkhaite, a mercury sulfosalt containing Cs and Tl"; Can Mineral 19:571-581; 1981.

Une étude à la microsonde électronique de 47 cristaux de galkhaite provenant de la mine Getchell, dans le comté d'Humboldt, au Nevada, indique que le Cs

dépasse Tl dans presque tous les cristaux. Il y a une opposition linéaire entre les teneurs en Cs et Tl de ce sulfosel; la pente du rapport Cs:Tl est d'environ 3:2.

026 Dutrizac, J.E. "Jarosite formation in chloride media"; Proc Australas Inst Min Metall 278:23-32; juin 1981.

Ce rapport traite de la détermination des facteurs affectant la formation de jarosite de sodium et de jarosite de sodium-plomb dans les solutions de chlorure de composition semblable à celle qu'il convient d'utiliser pour la lixiviation au chlorure ferrique des concentrés de galène. Il présente quelques données du bilan massique relatives à la précipitation des sulfates dans les solutions de chlorure, et le degré de co-précipitation de certains métaux communs bivalents a aussi été déterminé.

027 Donaldson, Elsie M. "Determination of aluminum in iron, steel and ferrous and non-ferrous alloys by atomic-absorption spectrophotmetry after a mercury cathode separation and lextration of the aluminum acetylacetone complex"; Talanta 28:461-467; 1981.

Ce document décrit une méthode de détermination de l'aluminium total ou de l'aluminium soluble dans les acides plus l'aluminium non soluble dans les acides, dans les aciers doux et les aciers à haute teneur ainsi que dans le ferrovanadium. L'aluminium total peut aussi être déterminé dans les alliages de cuivre et de nickel. L'auteur compare les résultats avec ceux qui ont été précédemment obtenus par la méthode spectrophométrique au violet de pyrocatechol.

028 Donaldson, Elsie M. "Spectrophotometric determination of boron in iron and steel with curcumin after separation by 2-ethyl-1,3-hexanediol-chloroform extraction"; Talanta 28:825-831; 1981.

L'auteur décrit une méthode simple et fiable de détermination d'au moins 0,0001% de boron total dans le fer et les aciers à faible et forte teneur. On peut aussi doser le boron soluble ou insoluble dans les acides. Les ions communs, y compris de grandes quantités de manganèse, chrome, vanadium, titane, molybdène, tungstène, niobium et tantale n'interfèrent pas.

029 Dutrizac, J.E. "The dissolution of chalcopyrite in ferric sulphate and ferric chloride media"; Trans Am Soc Metals 12B:371-378; 1981.

Les documents sur la lixiviation de la chalcopyrite par les ions ferriques ont été étudiés afin d'identifier les paramètres de lixiviation qui sont bien établis et de souligner des domaines qui nécessitent une étude supplémentaire. Les points obscurs sont réexaminés expérimentalement avec soin. Le rapport présente les résultats et l'étude des récentes information sur le sujet.

030 Dutrizac, J.E. et Chen, T.T. "The synthesis of mercury jarosite and the mercury concentration in jarosite-family minerals"; Can Mineral 19:559-569; 1981.

Ce rapport traite de l'étude des facteurs affectant la composition et la production de jarosite de mercure pendant la synthèse effectée par la technique d'addition lente. Pour un taux donné d'addition de mercure, la production augmente directement avec la température ou la concentration des ions ferriques, mais la teneur en mercure du produit est pratiquement indépendante de l'une ou de l'autre variable. Les coefficients de sépration relatifs à la répartition du mercure entre la solution et la phase jarosite ont été déterminés dans les systèmes Hg-K et Hg-Na. Les solutions dilués de mercure dans le système Hg-Na sont pratiquement idéales, mais le potassium est précipité dans le système Hg-K. Divers minéraux de la famille de la jarosite sont analysés afin de doser le mercure, mais aucun ne contient plus de 0,08% en poids de Hg.

031 Dutrizac, J.E. "The founding of the Canadian zinc industry"; Can Inst Min Metall Bull 15:1533-1539; 1980.

Ce document traite des premières tentatives de production de zinc métallique au Canada et fait remarquer la place prépondérante de Consolidated Mining and Smelting Company Limited (maintenant Cominco Ltd.) comme producteur de zinc au Canada.

032 Keyser, J. Hode et Malhotra, V.M. "Assurance of quality of concrete in North America - 1980-2000"; présenté au 6e Congrès de l'ERMCO, Bruxelles, 22-26 sept. 1980 (Sera publié dans le procés-verbal de la conférence).

Ce document traite de divers aspects d'un programme d'assurance de la qualité, en commençant par les spécifications et terminant par les essais sur place du béton qui, pense-t-on, seront bien acceptées par l'industrie du béton en Amérique du Nord en l'an 2000.

033 MacKinnon, D.J. et Brannen, J.M. "Evaluation of organic additives as levelling agent for zinc electrowinning from chloride electrolytes"; J Appl Electrochem 12:21-31; 1982.

Ce document traite de la détermination et de la comparaison des effets des divers additifs organiques: colle Pearl, Separan MP10, Percol 140 et chlorures de tetraalkylammonium sur la morphologie et l'orientation des gisements de zinc ainsi que sur le rendement de courant et les besoins en énergie pour l'extraction du zinc à partir d'un électrolyte au chlorure.

034 Malhotra, V.M. "Accelerated strength testing: Is it a solution to a contractor's dilemma?"; presented ACI Meet, Las Vegas, March 7, 1981, et dans Concr Int: Design and Construction 3:11-17-21; Nov. 1981.

L'auteur souligne la nécessité d'accélérer les effets de résistance afin d'améliorer le contrôle de la qualité dans l'industrie de la construction. Il décrit les méthodes d'essai actuellement appliquées et traite de leur utilisation dans les grands travaux de construction en Amérique du Nord.

035 Malhotra, V.M. et Carette, G.G. réponse à une étude par Luke M. Snell et Robert B. Rutledge d'un article intitulé: "Comparison of pullout strength of concrete with compressive strength of concrete with compressive strength of cylinders and cores, pulse velocity and rebound number"; Am Concr Inst J 152-155; mars-avril 1981.

036 Malhotra, V.M. "Rebound, penetration resistance and pulse velocity tests for in situ testing"; Concrete Construction 571-575; juillet 1981.

L'auteur décrit quelques méthodes d'essai non destructif permettant d'évaluer la résistance du béton en place afin d'enlever rapidement le coffrage ou d'étudier la résistance du béton en place en raison de faibles résultats des essais de cylindre.

037 Malhotra, V.M., Carette, G.G. et Brenner, T.W. "Durability of concrete in marine environment containing granulated blase furnace slag, fly ash or both"; Am Concr Inst Special Publication 65:157-168; 1980.

Recherche effectuée par CANMET pour déterminer la durabilité des bétons au ciment de Portland/scories granulées de haut-fourneau/cendre volante, en milieu marin.

038 Petruk, W. et Schnarr, J.R. "An evaluation of the recovery of free and unliberated mineral grains, metals and trace elements in the concentrator of Brunswick Mining and Smelting Corp. Ltd."; Can Min Metall Bull 74:833:132-159; 1981.

Ce document fait état des recherches sur le comportement des minéraux pendant la flottation d'un minerai de métal commun riche en pyrite à grains fins, par l'étude des produits de base, des concentrés et des résidus de chaque cuve de flottation à l'usine de Brunswick Mining and Smelting Corp. Ltd., à Bathurst, au Nouveau-Brunswick. L'analyse des échantillons porte sur les éléments suivants: Zn, Pb, Cu, Fe, Ag, Sb, Sn, Bi, In, Hg, Mo et As. Le résultat indique que le comportement des minéraux est bien mieux établi par la récupération des grains libres de minéraux que par celle des éléments.

039 Quon, D.H.H. et Wang, S.S. "Viscosity-temperature relationship of materials used for the experimental production of mineral wool"; J Can. Ceram Soc 50:17-22; 1981.

Un viscomètre à température élevée a été construit et évalué en mesurant les viscosités de produits en fusion composés de matériaux utilisés dans la production expérimentale de laine minérale à des températures variant de 1300 à 1630°C. Huit échantillons de scories et quartz, roche piège et calcaire ainsi que de résidus de syénite à néphéline et de mélanges de calcaires ont été préparés. Les résultats indiquent que la viscosité est très sensible aux variations de composition. On peut interpréter le changement de viscosité comme résultant du changement probable de structure faisant suite soit à la polymérisation, soit à la dépolymérisation de la structure.

040 Steger, H. "Ore and metal standards vital to labs"; GEOS 10:3:13-15; 1981.

Un matériau de référence certifié (MRC) se rapporte à un document de certification spécifiant les concentrations des éléments. Le présent document souligne la contribution de CANMET par le truchement de son projet canadien de matériaux de référence certifiés fournissant les matériaux de référence de composition d'origine canadienne.

041 Steger, H. "The new certification procedure of the Canadian Certified Reference Materials Project"; Geostandards Newsletter 2:189-193; oct. 1981.

Le projet canadien de matériaux de référence certifiés a modifié la procédure relative aux programmes de certification entre laboratoires. Les raisons de la réduction de 2 à 1 du nombre de bouteilles d'un matériau de référence soumis à chaque laboratoire participant aux opérations sont étudiées. On constate que l'effet du nombre plus petit de résultats dans le cas de l'étude d'une seule bouteille sur la valeur certifiée et l'intervalle de confiance de 95% n'a que peu d'importance.

LABORATOIRES DE RECHERCHE SUR L'ÉNERGIE

042 Brown, J.R., Fyfe, W.S. et Bancroft, G.M. "Semi-quantitative surface analysis of Mt. St. Helen's ash by X-ray photoelectron spectroscopy(XPS)"; Appl Surf Sci 7:419-424; 1981.

Un échantillon de tephra du mont Ste-Helen et d'étalon rocheux d'andésite de l'USGS (AGV-1) ont été analysés par spectroscopie photoélectronique aux rayons X. Les résultats montrent que l'on peut effectuer une analyse de surface afin de déterminer les principaux éléments sur des chantillons à composantes multiples pulvérisés (comme des échantillons géologiques) au niveau semi-quantitatif par application d'une équation spécifiant que les analyses spectroscopiques sont conformes à la densité de surface atomique. Les compositions de surface déterminées d'après cette méthode sont en accord avec l'analyse de fluorescence aux rayons-X. Il est intéressant de relever que l'analyse spectroscopique de cette cendre volcanique n'a pas établi un enrichissement en surface en chlore ou soufre et que l'on ne trouve que des traces de fluore bien que ces éléments volatils soient généralement abondants dans les gaz volcaniques.

043 Brown, J.R., Fyfe, W.S., Murray, F. et Kronberg, B.I. "Immobilization of U-Th-Ra in mine wastes"; Can Min J 102:71-76; 1981.

En traitant les effluents caractéristiques de la mine d'uranium d'Elliot Lake avec des solutions de calcite, de phosphate de potassium (300 ppm), avec ou sans moraines de fond, les niveaux de lixiviation du radium ont été réduits à moins de 0,1 pCi/L. Ces valeurs sont de l'ordre de celles de l'eau des océans et de l'eau douce de grande qualité. On peut réduire la perméabilité des résidus des mines à des niveaux faibles en utilisant des additifs argileux appropriés, et en particulier de fines couches de bentonite avant fermeture.

044 Fung, D.P.C. "The CANMET coal gasification program"; Chemistry in Canada 32(6):25; 1981.

Ce document présente le programme de gazéification du charbon, de CANMET. Les moyens utilisés pour la recherche sur place comprennent un gazéificateur à couche fixe de laboratoire et un réacteur à équilibre thermique à haute pression. On procède à l'évaluation de la réactivité de divers charbons canadiens dans une réaction de gazéification.

045 Furimsky, E. "Characterization of deposits formed on catalyst surface during hydrotreatment of coal-derived liquids"; Fuel Process Tech 6:1-8; 1982.

La perte d'activité d'un catalyseur est attribuée à la formation de structures aromatiques polynucléaires sur la surface. Les gisements renfermaient aussi des espèces lourdes contenant des hétéroatomes N et O. Les phénols, les composés aromatiques et hétérocycliques sont considérés comme les précurseurs dans le cadre de la formation des gisements.

046 Ozubko, R.S., Clugston, D.M. et Furimsky, E. "Comparison of mass spectrometry and nuclear magnetic resonance spectrometry for determination of hydrocarbon type"; Anal Chem 53:183; 1981.

Trois différentes fractions de pétrole ont été analysées par spectrométrie de masse, résonance magnétique nucléaire et analyse aux indicateurs fluorescents. On donne les résultats pour ces échantillons et l'on indique les suppositions et les limites relatives à chaque technique.

047 Poirier, M.A. et George, A.E. "Separation and characterization of coal-derived liquids"; Energy Sources 5:339-359; 1981.

Présentation des méthodes de sépration et de caractérisation des liquides extraits du charbon, mises au point au cours des dix dernières années. Le document présente aussi un guide de référence relatif à la séparation et la caractérisation de constituants particuliers.

048 Poirier, M.A. et George, A.E. "Selective separation and identification of olefins in petroleum and synthetic fuel naphtha"; Fuel 61:182-184; 1982.

Description d'une méthode d'analyse convenant à la séparation sélective et à l'identification des olefines dans le pétrole et l'essence lourde synthétique. Cette méthode est appliquée à deux essences lourdes synthétiques produites par traitement thermique et catalytique du pétrole lourd de Lloydminister. Les résultats indiquent que les oléfines sont produites au cours du traitement. Les oléfines de l'essence lourde catalytique ont une masse moléculaire nettement supérieure en moyenne à celle des essences lourdes thermiques. On a établi les configurations chimiques de 24 différentes oléfines dans les deux produits.

049 Whaley, H. et Lee, G.K. "The behaviour of buoyant plumes in neutral and stable conditions in Canada"; Air Pollution Control Assoc, Paper 81-66PI, Philidelphia, PA; juin 1981.

Les paramètres de dispersion des panaches obtenus pour cinq régions géographiques du Canada ont été évalués et comparés aux relations de prévisions classiques établis par Briggs et Pasquill-Gifford. Les données correspondent à des conditions neutres et stables, classe de stabilité C à F, mais elles excluent toutes les études ou situations de mélange limité ou d'atmosphère stratifiée où la topographie influence l'étendue du panache.

LABORATOIRES DE RECHERCHE EN MÉTALLURGIE PHYSIQUE

050 Biefer, G.J. "Arctic corrosion"; GEOS 11:1:18; hiver 1982.

Ce document présente les résultats d'une étude comparative des taux de corrosion de fil en acier doux installé en divers endroits isolés du nord de l'Arctique ainsi qu'en divers emplacements du Sud canadien. Ces taux de corrosion diminuent du sud vers le nord et le l'est vers l'ouest. Les taux les plus élevés dans l'Arctique correspondent presque tout le temps à des emplacements situés près de la mer.

051 Brigham, R.J. "Technical note: On the variability of crivice corrision initiation in ferric chloride exposure tests"; Corr 37:10:608; 1981.

Ce document décrit une étude entreprise afin d'expliquer la bande de dispersion de ±5°C qui a caractérisé la corrosion fissurée des aciers inoxydables austéniques. On évalue aussi l'importance relative de certaines substances comme les rubans élastiques à titre de matériaux sujets à fissures.

052 Couture, A. "Literature survey on the properties of cast Ni-Al and Mn-Ni-Al bronzes"; AFS Int Cast Metals J 6:2:33-46; 1981.

Ce document présente la comparaison des propriétés des bronzes d'aluminium à faible et forte teneur en manganèse, respectivement désignés comme alliages C95800 et C95700 selon la norme ANCI/ASTM B148-78. Il traite de leurs propriétés mécaniques à diverses températures et selon différentes épaisseurs de section ainsi que de leur comportement à la corrosion, leurs propriétés physiques et leurs caractéristiques de soudage et de fonderie.

053 Couture, A. "Iron in aluminum casting alloys - A literature survey"; AFS Int Cast Metals J 6:33-46; 1981.

Les diverses sources consultées ne font pas l'unanimité quant à l'effet du fer sur les propriétés mécaniques des alliages d'aluminium moulés; cependant, le fer a généralement une action négative. On avance diverses méthodes permettant de diminuer l'influence du fer présent au-delà de certains niveaux définis. On peut procéder à un refroidissement rapide, mais au cas où cette technique serait insuffisante ou impossible, on peut utiliser des neutralisateurs comme le manganèse avec assez bons résultats.

054 Crawley, A.F., Shehata, M.T., Pussegoda, N., Mitchell, C.M. et Tyson, W.R. "Batch-annealed dual phase steels"; Fundamentals of Dual Phase Steels 181-197; Chicago, Ill; fév. 23-24, 1981.

Ce document expose une étude faite en laboratoire sur la mise au point d'aciers à phase double C-Mn par recuit intercritique par procédé discontinu qui permettrait d'atteindre les normes suivantes: limites élastiques (déformation 0,2% - 380 MPa), (déformation 3,0% - 480 MPa); résistance limite à la traction - 620 MPa; allongement total sur 25,4 mm - 27%. Les propriétés de traction et les microstructures d'une gamme d'aciers à C-Mn sont décrites ainsi que la méthode expérimentale et les résultats préliminaires de mise en modèle.

055 Davis, K.G. et Magnu, J.G. "Cast-in-place hardfacing"; presented Congr, Cincinnati, Ohio; sept. 1981.

Présentation d'une méthode de surfaçage des moulages dans laquelle le métal est versé dans un moule en sable et soutiré par vide dans une couche de poudre (ou de grains) résistant à l'abrasion, placée sur une paroi de la cavité du moule. La poudre infiltrée forme un revêtement scellé métallurgiquement, résistant à l'abrasion, sur la pièce coulée. Etant donné que la surfaçage et le moulage se combinent en une seule opération, il en résulte d'importantes réductions de coûts.

056 Dion, J.L. "Copper tuyeres with integrally cast copper tubing"; presented 20th Ann. CIM Conf; Hamilton, Ont.; 26 août, 1981.

Une étude a été faite portant sur les techniques de coulage intégral de tubes en cuivre dans des tuyères en cuivre pour utilisation dans des hauts-fourneaux afin de produire des tuyères à deux compartiments qui présentent une meilleure capacité de refroidissement à l'eau. On a utilisé un schéma d'essai correspondant à une section verticale d'une tuyère à deux compartiments et d'un tube en cuivre coulé sur place pour étudier les variables telles que la préparation du tube, le refroidissement du tube, la température et le taux de coulée ainsi que la forme de l'ouverture. On constate que la température de coulée, la vitesse de coulée et le type de refroidisseur doivent être contrôlés si l'on veut obtenir une pièce en cuivre contenant un tube en cuivre intégralement moulé.

057 Knight, R.F., Tyson, W.R., Lavigne, M.J., McGrath, J.T. et Boyd, J.D. "Materials for hydrogenation vessels"; Conf Proc Am Soc Metals 139-163; 1981.

Les structures principales d'une usine d'hydrogénation sont de grandes cuves de réacteur contenant le cycle de procédé à de hautes pressions partielles d'hydrogène et de hautes températures. Etant donné des conditions critiques de l'environnement et la dimension des cuves, les méthodes appliquées doivent être conformes à des normes structes. Le présent rapport décrit les matériaux et les méthodes de fabrication existants.

058 McGrath, J.T., Patchett, B.M., Tyson, W.R. et Knight, R.F. "Fabrication technology and material property requirements for heavy wall pressure vessels; presented at Conf on Quality Manufacturing in the 80's; Toronto, Ontario; oct. 1981.

Ce document présente une étude de l'assemblage d'aciers profilés dans la fabrication de grandes cuves sous pression. On y étudie les propriétés en cours d'utilisation des aciers des cuves sous pression, en particulier le recouvrement des soudures en acier inoxydable et en métal commun de 2,25 Cr-1 Mo. Les résultats d'une étude de l'effet du phosphore et du silicium sur la fragilité de revenu d'un acier à 2,25 Cr-1 Mo et le rôle de l'addition de terres rares pour réduire la susceptibilité à la fragilité du revenu sont présentés. La présence d'hydrogène dans le recouvrement en acier inoxydable peut entraîner une perte de ductilité fonction de l'importance de la phase sigma et le décollement de l'interface recouvrement/métal de base.

059 Ng-Yelim, J. "The effects of microstructure on the tensile and impact properties of a 1,0 pct V, 0,2 pct C steel"; Can Metall Quart 20:4:429-436; 1981.

Ce rapport présente l'étude des effets de divers traitements thermiques sur la microstructure et les propriétés mécaniques d'un acier à 1% V, 0.2% C. Les limites des températures élevées d'austénitisation sont examinées et le traitement thermique que produit de bonnes propriétés mécaniques est étudié.

060 Packwood, R.J. et Brown, J.D. "A gaussian expression to describe curves for quantitative electron probe microanalysis"; X-ray Stectrom 10:3:138-145; 1981.

Ce document montre que la répartition en profondeur de la production de rayons X dans une microsonde électronique peut être décrite de façon précise par une équation de Gauss modifiée à la surface de l'échantillon par une transition. Les équations proposées fournissent une base théorique et expérimentale solide à l'analyse à la microsonde.

061 Paley, Z., Ng-Yelim, J. et Martin, P. "A weldability testing procedure for premium rail steels with reference to V-N steels"; Welding J 60:1:7-s-11s; 1981.

Une méthode a été mise au point qui permet la réalisation de soudures à l'éclair électrique simulées à partir de divers aciers à rails expérimentaux V-N dans un appareil de Gleeble, en utilisant des échantillons de 10 x 75 mm (0,39 x 0,39 x 3,0 po). Une gamme assez large de vitesses de refroidissement ont donné des structures perlitiques. La répartition de la dureté dans la partie soudée simulée des échantillons est presque uniforme, ce qui montre que les aciers à rails V-N ont une bonne soudabilité à l'éclair électrique. On présente une méthode de détermination des paramètres de soudage à l'éclair électrique qui a été appliquée au soudage de rails au Cr-Mo.

062 Revie, R.W. "An electrode design for dual measurement of potentials inside artificial pits and on polarized surfaces"; Electrochem Soc Fall Meet. 81:2:423-424; Denver, Colorado; oct. 1981.

L'auteur présente une électrode devant permettre de mesurer simultanément les potentiels à la surface et à l'intérieur d'une fosse artificielle. Des mesures doubles ont été effectuées pour des électrodes polarisées cathodiquement dans 0,012 N $NaHCO_3$ + 0,003 N Na_2CO_3, solution correspondant aux conditions de corrosion des pipelines. On évalue ensuite l'effet de la corrosion précédente du point de vue de l'accroissement de la différence de potentiel mesurée ensuite entre la surface de l'électrode et l'intérieur de la fosse.

063 Sahoo, M., Edwards, J.O., Beke, L.J. et Szanto, Z. "High integrity cupronickel castings for technology demonstration and sea-water service evaluation"; AFS Trans 89:645-652; 1981.

Une fonderie commerciale a procédé à une étude faisant suite à des études en laboratoire sur la technique de fonderie des alliages de cuivre-nickel modifiés au niobium, sous forme de huit coulées différentes. Ce document décrit la conception des systèmes de passage et d'évent, des méthodes de fusion pour ces moulages ainsi que les changements progressifs de fixation des moules qui améliorent leur qualité.

064 St. John, D.H., Davis, K.G. et Magny, L.G. "Computer modelling and testing of metal flow in gating systems"; Can Metall Quart 359-368; juillet-sept. 1981.

Un modèle à éléments finis initialement établi pour l'étude des problèmes d'ondes d'injection a été adapté au calcul de l'écoulement libre en surface des métaux liquides par un système d'ouverture. Le modèle a été perfectionné à un point où l'on obtient une bonne corrélation entre les scémas d'écoulement observés et calculés.

065 Vosikovsky, O. et Rivard, A. "The effect of hydrogen sulphide in crude oil on fatigue-crack growth in a pipeline steel"; Corr J 38:19-22; 1982.

Ce document présente les résultats d'une étude sur l'acier de pipeline X65, immergé dans du pétrole brut contenant du sulfure d'hydrogène à des taux de concentration variant de 30 ppm à saturation. Cette étude fournit des données nécessaires à l'évaluation de la durée de résistance à la corrosion des structures fissurées transportant du pétrole brut corrosif. Les résultats indiquent que le taux d'augmentation des fissures dans le pétrole brut est fonction de la teneur en sulfure d'hydrogène.

066 Vosikovsky, O. et Rivard, A. "Growth of surface fatigue-crack in a steel plate"; Int J Fatique 3:3:111-115; juillet 1981.

Les taux de croissance des fissures de fatigue ont été mesurés en surface et à l'intérieur de la plaque d'acier de pipeline X65 en utilisant la solution à éléments finis de Raju et Newman. Les résultats indiquent une bonne concordance avec les valeurs mesurées sur les échantillons à fente unique sur le rebord. La variation de forme d'une fissure de fatigue de surface grandissante est analysée et comparée à d'autres mesures publiées et aux prévisions analytiques de Nair.

067 Warda, R.D., Darke, E.F. et Guindon, H.P. "The true thermal efficiencies of 30 cupolas"; AFS Trans 98:719-730; 1981.

Des essais exhaustifs ont été entrepris dans 30 fonderies pour déterminer l'efficacité de la fusion en cubilot et des modes opératoires. La répartition de l'énergie calorifique initiale entre les différents éléments produits (métal, scories, gaz perdus ainsi que les autres éléments perdus) a été déterminée pour chaque cubilot. On établit ensuite les coûts ralatifs au coke, au niveau du métal chaud à la sortie du cubilot ainsi que pour les pièces moulées expédiées. On identifie de nombreuses possibilités d'économie de coke et leur impact potentiel est quantifié. Des exemples indiquent la façon dont certaines fonderies ont changé la conception de leur cubilot et leurs méthodes de façon à améliorer le rendement des activités de fusion et à réduire les coûts correspondants.

LABORATOIRES DE RECHERCHE MINIÈRE

068 Bigu, J. "The loss of radioactive decay products of radon and thoron in underground uranium mine environments"; CIM Bull. 74:832:83; août 1981.

Ce document présente des données expérimentales sur le dépôt de particules sur les parois, données appliquées aux mines souterraines d'uranium. Bien que les calculs soient essentiellement de valeur qualitative, le manque de documentation plus appropriée indique que la perte de particules radioactives, par exemple des produits de désintégration du radon et du thoron sur les parois des mines souterraines d'uranium est importante et qu'il conviendrait d'en tenir compte dans les calculs de leur concentration dans l'atmosphère des mines.

069 Bigu, J. "On the effect of a negative ion-generator and a mixing fan on the plate-out of radon decay products in a radon box"; Health Phys; 1981.

Ce document traite des études effectuées sur l'effet d'un générateur d'ions négatifs et d'un ventilateur mélangeur sur le niveau de travail de produits du radon dans un caisson à radon. On observe une diminution importante du NT lorsque le générateur d'ions ou le ventilateur mélangeur fonctionne. L'effet combiné de ces deux équipements est nettement plus important que celui de l'un ou l'autre d'entre eux. Des expériences sont entreprises à des taux d'humidité relative variant de 45 à 95% et à une température de 20°C ± 3°C, et l'on constate que les effets observés sont pratiquement indépendants de l'humidité relative dans le caisson.

070 Feng, K.K. et Hanasaki, A. "A numerical study of the behaviour of liquid and slurry explosives under projectile impact"; Propell Explos 6:74-87; août 1981.

Ce document présente l'étude des processus de base de l'impact de projectile sous forme de liquide ou de boue causé par des explosifs contenant des bulles de gaz; il s'agit d'une étude numérique faisant appel à l'application d'un modèle non stationnaire à deux dimensions. Les équations différentielles partielles dérivées des lois de la conservation de la masse et du moment ainsi que l'équation de l'état proposée par Tait sont résolues par application d'un code informatique TENSOR à différence fini.

DIVISION DE L'INFORMATION TECHNOLOGIQUE

071 Dixon, C. "Steel with less energy"; GEOS 10:4:20-21; automne 1981.

Ce document présente une méthode mise au point par CANMET pour la production de produits d'acier de petite section par coulée horizontale. Cette méthode revient moins cher et utilise moins d'énergie que la méthode classique de coulée de lingot. Cette méthode pourrait intéresser les fabricants d'outils, d'automobiles et de machines en leur permettant de recycler leurs propres déchets métalliques.

SECTION 3

PRÉSENTATIONS ORALES

Les rapports suivants ont été présentés à divers colloques, réunions et conférences. Comme il est indiqué, certains ont été publiés dans le procès-verbal ou dans un périodique. On peut se procurer ces rapports dans les périodique ou du procès-verbaux, ou s'adressant directement à l'auteur.

LABORATOIRES DES SCIENCES MINÉRALES

072 Ahmed, S.M. "Photoelectrochemical cells for solar energy conversion"; ERP/MSL 82-11(OP); présenté à la série de séminaires du LSM de CANMET, Ottawa, Ontario; le 9 février 1982.

L'énergie solaire représente une source inépuisable d'énergie propre et éventuellement à bon marché qui peut être transformée en électricité ou en combustible chimique comme l'hydrogène par photoélectrolyse directe de l'eau. Les cellules photoélectrochimiques employant des raccordements liquides à semi-conducteurs offrent une solution de conversion de l'énergie solaire pouvant remplacer l'utilisation classique de cellules solaires photovoltaiques transistorisées utilisant des jonctions p-n et d'autres formes. Les avantages présentés sont: (1) facilité d'établissement des jonctions liquides à semi-conducteurs, (2) des normes de pureté moins exigeantes, et (3) la possibilité d'emmagasiner l'énergie et de la convertir sous forme chimique comme l'hydrogène, par photoélectrolyse directe de l'eau.

073 Ahmed, S.M. "Studies of the interfacial effects in the photoelectrochemistry of semiconductors"; ERP/MSL 81-119(OPJ); présenté à l'Electrochem Soc Conf, Denver, Col.; 11-16 oct. 1981.

Ce document fournit des informations sur la nature des équilibres semi-conducteur - solution en l'absence de tout couple supplémentaire redox, l'origine de la charge et du potentiel de surface dans la double couche réversible (aqueuse), la répartition du potentiel à l'interface, ainsi que les effets de ces paramètres sur le comportement photoélectrochimique des semi-conducteurs.

074 Cabri, L.J. "Mineralogy and distribution of the platinum-group in mill samples from the Cu-Ni deposits of the Sudbury, Ontario area"; MRP/MSL 82-711(OPJ); présenté à la 4th Int Precious Metals Inst Conf, Toronto; juin 1981; et dans le procès-verbal.

Des études minéralogiques détaillées ont montré que la minéralogie des éléments du groupe du platine varie d'un gisement à l'autre, mais, dans l'ensemble de la région de Sudbury, les principaux minéraux du groupe du platine sont la michenerite, la sperrylite et la moncheite. Les moins courants sont: insizwaite, froodite, sudburyite, kotulskite, merenskyite, niggliite, mertieite II, hollingworthite, irarsite et trois minéraux sans nom. Les analyses effectuées sur place ont aussi permis d'établir que les Pd, Pt et Rh se présentent sous forme de solutions solides diluées (56-1840 ppm) dans les sulfarséniures (cobaltite et gersdorffite). La présence d'éléments du groupe platine sous forme de solutions solides plus diluées dans les sulfures communs ne peut être établie que par l'application de méthodes indirectes. L'auteur propose de démontrer la possibilité d'utiliser une base de données minéralogiques pour les échantillons variant de quelques dizaines à quelques centaines de ppb d'éléments du groupe du platine pour la détermination des bilans métalliques pendant le traitement des minerais de Cu-Ni, ainsi que la détermination des domaines de recherche permettant d'améliorer la récupération des métaux.

075 Campbell, M.C. "Uranium extraction in Canada - Status 1982"; ERP/MSL 82-19(OP); présenté au Groupe de travail NEA/IAEA sur l'extraction de l'uranium, Vienne; 8-10 mars 1982.

Présentation de diverses innovations technologiques dans trois régions productrices d'uranium du Canada: Elliot Lake, Bancroft et la Saskatchewan.

076 Campbell, M.C., Ritcey, G.M. and Joe, Z.G. "Chloride metallurgy for uranium recovery: Concept and costs"; ERP/MSL 81-126(OP); présenté au NEA Ore Processing/Tailings Conditioning Workshop, Fort Collings, Col., 28-29 oct. 1981.

Description du concept de la métallurgie au chlorure pour l'extraction de l'uranium. Les résultats de l'étude de ce nouveau concept indiquent qu'il offre une solution de remplacement de la méthode de lixiviation à l'acide sulfurique permettant la solubilisation quantitative du radium.

077 Feng, K.K. "Desorption of gases from Canadian coals"; ERP/MRL 81-20(OPJ); présenté à la 10th Int Conf on Safety in Mines Research, Katowice, Pologne; 6-14 oct. 1981. (Sera publié dans le procès-verbal de la conférence.)

Ce document traite du rapport et de la corrélation par l'équation d'Airey de la désorption des gaz des carottes de forage pris dans les filons de houille en Nouvelle-Écosse, en Alberta et en Colombie-Britanique. Les courbes de désorption ainsi que de taux initial donnent des informations utiles à la conception des systèmes de ventilation dans les mines souterraines. La corrélation de la teneur en gaz en fonction de la profondeur établie à partir des carottes de forrage puis dans des filons multiples à Elkford, en C.-B., indique qu'à 200 m, la teneur en gaz n'est égale qu'au quart de celle que l'on a à 400 m.

078 Laguitton, D. "Methodology transfer for the simulation of mineral and coal processing plants"; MRP/MSL 81-45(OP); présenté au CIM 83rd Ann. Gen Meet., Calgary, 3-6 mai 1981.

Les mathématiques, la théorie et la pratique des méthodes ainsi que les applications informatiques sont les principales disciplines qui contribuent à la mise au point de techniques utilies de simulation informatique des usines de traitement des minéraux et du charbon. Le projet SPOC de CANMET porte sur la simulation informatique et s'adresse sur ce plan aux problèmes propres au transfert de méthodologie. Le principal objectif du projet était le programme MATBAL 2 de bilan matériel qui a été acquis par plus de 20 organismes. L'expérience de CANMET relative au transfert de méthodologie par l'intermédiaire de documentations, d'ateliers industriels, et de programmes d'été pour les étudiants et son avenir est souligné.

079 Malhotra, V.M. "International conference on the performance of concrete in marine environment, August 1980 - A review"; présenté au 5th Int Symp on Concrete Technology; Caracas, Vénézuela; 17-20 novembre 1980.

En août 1980, une convérence internationale de cinq jours sur le comportement du béton en milieu marin s'est tenue au Canada. Un total de 33 articles provenant de 11 pays a été présenté. Le présent document passe en revue les sujets traités et donne une liste complète des présentations.

080 Malhotra, V.M. "Evaluation of concrete by ultrasonic pulse velocity method"; MRP/MSL 81-113(OP); présenté à la 6th Ann. Conf on Concrete Technology; Caracas, Venezuela; octobre 1981.

Ce document souligne les principes de la méthode des vitesses d'impulsion ultrasoniques pour l'évaluation du béton. Les facteurs qui jouent sur les mesures de vélocité des impulsions et les principaux domaines d'application sont présentés. L'étude indique les limites de cette méthode sur le plan de l'évaluation de la résistance du béton. Etant donné qu'un grand nombre de variables affectent les relations entre les paramètres de résistance du béton et sa vitesse d'impulsion, l'utilisation de cette dernière pour évaluer les résistances à la compression par flexion du béton n'est pas recommandée. Il faudrait au contraire envisager sérieusement l'utilisation de la vitesse d'impulsion comme moyen de contrôle et ne pas essayer de relier la vitesse d'impulsion aux paramètres de résistance.

081 Mirkovich, V.V. et Bell, K.E. "A novel method for predicting thermal shock resistance of brittle materials"; MRP/MSL 80-173(OPJ); présenté au Can Ceram Soc Ann Meet, Toronto; février 1981 et dans J Can Ceram Soc 50:28-33; 1981.

Des travaux précédents ont indiqué une relation entre l'écaillage thermique des roches et le résultat de la dilatation thermique et de la diffusivité thermique. L'étude présente étend ce principe à la rupture thermique d'une série de masses argileuses. On obtient une bonne corrélation entre l'ordre de rupture prévu en cas de choc thermique et la rupture réelle déterminée par une méthode empirique.

082 Petruk, W. et Schnarr, J.R. "The behaviour of galena, chalcopyrite and tetrahedrite during flotation of a fine-grained base metal ore in the concentrator of Brunswick Mining and Smelting Limited"; MRP/MSL 81-7(OPJ); Am Inst Min Metall; Process Mineralogy 201-212; 1981.

Les trois minéraux ci-dessus ont été soumis à une analyse d'image de façon à déterminer leur teneur et leur récupération en fonction des grains minéraux libres et non libérés ainsi que de leur répartition dimensionnelle. Les résultats montrent que 37% en poids seulement de la galène a été libérée tandis que 88% en poids de la galène libre a été récupérée, ce qui indique un bon rendement de traitement pour le plomb. La récupération du plomb atteint la valeur de 65% en poids, la perte principale étant due à la galène non libérée. La plus grande partie de la galène non libérée perdue dans les résidus de traitement à des grains tellement fins que la libération de la galène et la récupération du plomb ne s'améliorent pas de façon marquante par une repulvérisation. La libération de chalcopyrite est de 56% en poids mais 75% seulement de la chalcopyrite libre est récupérée. La récupération du cuivre est de 45% en poids, la perte de chalcopyrite dans les résidus de traitement se présentant à la fois sous forme de gros grains libres et de grains non libérés petits et gros. Les calculs indiquent que les récupérations de cuivre pourraient être améliorées d'environ 8 à 10% en poids en modifiant l'exploitation du concentrateur et en procédant à une repulvérisation. Une quantité égale à environ 29% en poids de l'argent est perdue sous forme de résidus, principalement sous forme de grains de tetrahédrite argentifère libres et non libérés, gros et très petits. Les calculs indiquent aussi qu'environ 25% en poids de l'argent peut être récupéré en améliorant les conditions de traitement et en procédant à une repulvérisation.

083 Ritcey, G.M. and Ashbrook A.W. "Treatment of cobalt arsenide feeds for the subsequent recovery of cobalt"; MRP/MSL 80-172(OPJ); CIM Bull 74:834:103-112; 1981.

Ce document résume les conditions optimales de lixiviation pour chacun des matériaux d'alimentation arsenicaux contenant du cobalt, décrit le traitement des solutions avant l'étape de purification de la récupération du cobalt, et étudie le fonctionnement de l'usine à base d'une alimentation ainsi que le traitement des effluents.

084 Silver, M. et Dinardo, O. "Factors affecting the oxidation of thiosalts by thiobacilli"; MRP/MSL 80-160(OPJ); présenté à la Can Soc Microbiol Ann Meet, juin 1981. (Sera publié dans Applied and Environ Microbiol).

Ce document présente les résultats d'une étude sur les effets de la température, du pH initial et des concentrations d'ammonium, de phosphate et de métaux lourds sur l'oxydation de thiosels par une contrainte véritable due au Thiobacillus thiooxidans et par une culture mixte isolée d'un bassin d'effluents d'une usine de traitement de métaux communs.

085 Smith, C.W. "Determinations of radioactive isotopes by the Spectrochemistry Section, Chemical Laboratory"; ERP/MRL/MSL 81-147(OP); présenté à la série de séminaires de LSM CANMET à Ottawa, Ontario, le 10 novembre 1981.

Le groupe de la radiochimie de la section de la spectrochimie indique les déterminations des teneurs en isotopes radioactifs à l'appui de quelques projets importants des domaines de la "technologie des minéraux" et "technologie énergétique" du programme des minéraux et des sciences de la terre de CANMET. Ces projets portent sur le traitement des minerais radioactifs et les problèmes environnementaux qui s'y rapportent, et nécessitent la mesure des isotopes de la série de désintégration de l'uranium et du thorium présents dans diverses matrices. Ce document présente une revue des techniques radioanalytiques actuellement utilisées et mises au point par le groupe pour répondre à ces exigences, en mettant en évidence les applications des méthodes spectrométriques aux particules alpha et aux rayons gamma. Les limites imposées par diverses interférences chimiques et spectrales sont indiquées.

086 Wheat, T.A. "Solid electrolytes - Their nature and applications"; ERP/MSL 82-42(OP); présenté au Colloque sur les laboratoires des sciences minérales, Ottawa; 14 avril 1981.

Présentation d'une étude sur les caractéristiques structurales et diélectriques des solides à conduction ionique. Ce document traite des applications importantes sans cesse croissantes de ce groupe de matériaux et souligne le programme ionique actuel à CANMET ainsi qu'à l'extérieur.

087 Wheat, t.A., Hanson, A.J. et Starchuk, J.M. "An examination of the sodium-, potassium-and hydrogen-conducting forms of zirpsio ceramic"; ERP/MSL 81-16(OP); présenté au Sem Fast-Ion Conductors, Queen's Univ.; 2 février 1981.

Description de la production de céramique au zirpsio monophasée, de densité élevée par pressage à chaud. Ce matériau qui a une conductivité ionique de 2.10^{-1} $(olm.cm)^{-1}$ à 3000°C, est comparable à la meilleure des alumines au sodium beta. La conversion de ce matériau aux matériaux analogues à conduction de potassium et d'hydrogène est étudiée.

088 Wheat, T.A., Kuriakise, A.K. et Packwood, R.H. "The sodium zirpsios: Their development and behaviour"; ERP/MSL 82-15(OP); présenté à la Ann Conv, Can Ceram Soc; 28 février-2 mars 1982.

Ce document présente l'étude de l'ethérogénéité, des caractéristiques d'assemblage de phase et de la cinétique des réactions avec l'eau d'une série de matériaux ayant la composition générale $Na_{1x}Zr_2Si_xP_{3-x}O_{12}$ Na-zirpsio). Les auteurs concluent qu'une perte de Na et de P peut se produire pendant le frittage causant la précipitation de petites quantités de ZrO_2 monoclinique et la formation d'une phase vitreuse. Les impuretés comme Al_2O_3 tendent à se concentrer dans le verre: le temps de frittage et la teneur en impuretés accroissent la quantité de verre formé. Les matériaux réagissent au contact de l'eau, faisant passer une partie du Na et du phosphate dans la solution, la vitesse de réaction augmentant avec l'augmentation de la teneur en SiO_2. La présence d'une petite quantité d'Al_2O_3 (0,5% en poids) augmente la réactivité du zirpsio avec l'eau, selon un facteur de près de 10^4.

089 Wheat, T.A. and Starchuk, J.M. "Examination of compositional variations in Na-ZIRPSIO ceramics"; ERP/MSL 81-24(OPJ); présenté à Ann Meet Can Ceram Soc, 22-24 février 1981 et dans J Can Ceram Soc.

Ce document décrit la synthèse des céramiques $Na_{1-x}Zr_2Si_xP_{3-x}O_{12}$ monophasées à densité élevée (x = 1,8 à 2,4) ainsi que les microstructures caractéristiques. Les compositions pour lesquelles la valeur de x se trouve entre 1,8 et 2,0 présentent un matériau monophasé à grains exceptionnellement fins et ayant une structure monoclinique, tandis que les compositions pour lesquelles X varie de 2,1 à 2,4 présentent une structure à grains plus gros, une faible concentration de zirconium monoclinique comme seconde phase et une symétrie rhombohèdrique.

090 Wilson, H.S. "The properties and applications of lightweight aggregates and concrete"; MRP/MSL 81-98(OP); présenté à la 6th Ann Conf Concrete Technology; Caracas, Vénézuela; 26 octobre 1981.

Les aggrégats légers formés d'argile, schiste, schiste argileux, escarbilles, scorie de hauts-fourneaux, pierre-ponce, vermiculite et perlite, ont des masses spécifiques variant de 30 à 900 kg/m^3. Ce rapport décrit les matériaux bruts, les méthodes de production, les propriétés et les diverses applications, en particulier pour la fabrication des bétons légers. Ceux-ci vont du béton isolant à 240 kg/m^3 au béton de construction à 1920 kg/m^3.

LABORATOIRES DE RECHERCHE SUR L'ÉNERGIE

091 Andersen, N.E. et Hamza, H.A. "The characterization of oxidized coal - A review"; ERP/ERL 82-32(OPJ); présenté à la 64th Conf, Chem Inst Canada, Halifax, 31 mai-3 juin 1981, et dans le procès-verbal.

Ce document présente un résumé des méthodes utilisées pour la détection ou la quantification de l'oxydation du charbon. Il traite particulièrement des problèmes et des limites des données obtenues. On y trouve une bibliographie des diverses méthodes appliquées.

092 Brown, J.R., Kronberg, B.I. et Fyfe, W.S. "An ESCA examination of coal and coal ash surfaces"; ERP/ERL 81-33(OP); présenté à la ICI Conf, Coal Symp, Halifax, 3 juin 1981; et dans Coal - Phoenix of the 80's, Chem Inst Canada 114-121; 1981.

Deux échantillons de charbon provenant du Bureau national des normes et quatre échantillons nord-américains sont examinés par application de la technique directe, à surface sensible, de la spectroscopie photoélectronique aux rayons X. Les résultats montrent que cette technique se prête bien à la détermination de l'emplacement des éléments dans le charbon et la géochimie du charbon.

093 Brown, T.D., Leeder, W.R., Price, J.T. et Gransden, J.F. "The role of CANMET in the research activities of the Canadian Carbonization Research Association"; ERP/ERL 80-59(OP); présenté à la 19th Conf Metall, Can Inst Min Metall, Halifax, 24-28 août 1980.

Le ministère de l'Énergie, des Mines et des Ressources fournit, à titre de membre associé, les installations permettant à l'Association canadienne de la recherche sur la carbonisation de procéder à ses activités de cokéfaction et d'évaluation des ressources. Les objectifs visés sont l'amélioration de la qualité du coke utilisé dans les hauts-fourneaux canadiens, l'amélioration de la qualité des cokes fabriqués à partir des mélanges de charbons canadiens et l'élargissement de la gamme de charbons servant à la cokéfaction au Canada. Ce document présente les programmes expérimentaux faisant appel à l'utilisation de fours à coke d'échelle industrielle pour étudier les effets de la pulvérisation sélective, le briquettage partiel et l'addition de poix. Ces programmes ont permis de constater que ces objectifs peuvent être atteints en utilisant des charbons dont disposent les aciéries canadiennes ou des charbons produits par des houillères canadiennes.

094 George, A.E. et Beshai, J.E. "Distribution of polynuclear aromatic ring classes in the Alberta bitumens and crude oils"; ERP/ERL 81-09(OP); présenté à Am Chem Soc Meet., New York, NY; 1981.

Ce rapport fait état de l'étude des effets de la maturation géothermique simulée et naturelle sur la teneur totale en hydrocarbures aromatiques polynucléaires et la répartition de leur nombre d'anneaux. La réponse de la substitution de l'alkyle sur ces hydrocarbures aux effets de la maturation est aussi contrôlée. Le traitement donne une répartition des anneaux de ces hydrocarbures semblable à celle que l'on trouve dans le cas du pétrole léger de Medicine River, et diminue de beaucoup la teneur en hydrocarbures aromatiques polynucléaires. Les systèmes à trois et quatre anneaux fondus augmentent en même temps que diminuent les hydrocarbures contenant plus de quatre anneaux fondus. La substitution d'alkyle est aussi réduite sous l'effet des maturations aussi bien naturelles que simulées.

095 George, A.G., Beshai, J.E. et Smiley, G.T. "Effect of burial depth on the hydrocarbon-type distribution on the bitumens and oils from the Alberta basin"; ERP/ERL 81-57(OP); présenté à Am Chem Soc Meet, San Antonio, Texas, 9 décembre 1981.

Une étude systématique de la formation des hydrocarbures et de leur conversion sous l'effet de la maturation, en particulier géothermique, peut améliorer la fiabilité des prévisions dans le domaine de l'exploration pétrolière. Après simulation de la maturation thermique du bitume de l'Athabasca, on contrôle les modifications chimiques qui se produisent au cours des traitements thermiques de réduction avec des intensités croissantes, et l'on constate que la composition chimique du bitume change et ressemble de plus en plus à celle des pétroles du Crétacé.

096 Kelly, J.F. "The CANMET coal liquefaction contract program"; ERP/ERL 81-34 (OP); présenté au 2e Congrès mondial de génie chimique, Montréal, 4-9 octobre 1981, et publié dans le procès-verbal.

Présentation d'une brève revue du Programme de liquéfaction de charbon, à contrat pour CANMET. Ce document souligne les domaines de priorités et les orientations prévues. Il présente aussi les résultats des projets du programme relatifs au comportement à la liquéfaction du charbon sous-bitumineux de l'Alberta dans les expériences de traitement de ce charbon ainsi que du bitume de l'Athabasca ainsi que de l'extraction supercritique du gaz avec le toluène.

097 Lee, G.K., Brown, T.D., Friedrich, F.D. et Whaley, H. "Canadian low-rank coals: Resources, conversion and utilization"; ERP/ERL 81-46(OP); présenté au 11th Biennal Lignite Symp, San Antonio, Texas; 14-16 juin 1981.

Présentation d'une revue du rôle du charbon de faible qualité au Canada en ce qui traite des ressources et des réserves possibles; des demandes de marché présentes et futures; des projets en cours de recherche, de développement et de démonstration, ainsi que des perspectives.

098 Lee, G.K., Friedrich, F.D., Steindl, S.I. et Whaley, H. "A pilot-scale combustion research facility for low-quality fuels"; ERP/ERL 81-52(OP); présenté à la Engineering Foundation International Conference on Experimental Research into Fouling and Slagging Resulting from Impruities in Combustion Gases, Henniker, N.H.; 12-17 juillet 1981. (Sera publié dans le procès-verbal de la conférence.)

Le laboratoire canadien de recherche sur la combustion de CANMET a récemment conçu une nouvelle installation à l'échelle pilote pour l'évaluation des combustibles locaux de faible qualité, contenant des cendres, y compris le charbon des gisements nouvellement mis en exploitation, des coulis de charbon, de la biomasse, du coke de pétrole, des résidus liquides de raffineries et des émulsions de bitume/eau. Ce document explique la raison de la construction de l'installation de recherche, présente les considérations essentielles relatives à la conception ainsi qu'une description du système de combustion.

099 Leeder, W.R., Gransden, J.F. et Price, J.T. "Cokemaking with Canadian coals"; ERP/ERL 81-42(OPJ); présenté à la 64th Conf, Chem Inst Can., Halifax; 31 mai-3 juin 1981.

Ce rapport étudie certaines des conclusions des études de CANMET portant sur l'évaluation de la qualité du charbon cokéfiant au Canada et son utilisation dans le cadre de nouvelles techniques de fabrication du coke. On a étudié les types commerciaux de mélanges de charbon cokéfiants canadiens et les résultats ont été trouvés satisfaisants. Les charbons cokéfiants canadiens forment d'excellents éléments de mélanges cokéfiants et se prêtent bien aux nouvelles techniques de fabrication du coke.

100 Nandi, B.N., MacPhee, J.A., Ciavaglia, L.A. Chornet, E. et Arsenault, R. "Role of mesophase in upgrading inert-rich oxidized coals for combustion"; Procès-verbal de la 15th Carbon Conf, University of Pennsylvania, PA; 22-26 juin 1981.

Il est difficile de brûler efficacement les charbons riches en matières inertes oxydées et la présence d'un pourcentage élevé de carbone non brûlé dans les résidus de combustion et les escarbilles rend leur utilisation non souhaitable. On a étudié de façon intensive la liquéfaction du charbon et de la tourbe en utilisant du monoxyde de carbone et de l'eau. Un processus à l'échelle du laboratoire (lot) a été mis au point afin de permettre l'amélioration de la combustion de ce type de charbon. On a pu de la sorte constater l'augmentation des maximums relatifs à la dilatation, la contraction, la plasticité et le développement de la mésophase initiale qui se prêtent bien au rétablissement de la tendance à obtenir la meilleure combustion.

101 Nandi, B.N., MacPhee, J.A., Ciavaglia, L.A., Chornet, E. et Arsenault, R. "Upgrading of inert-rich oxidized coal from Western Canada with reducing gases to improve combustion performance"; Procès-verbal de la 64th Can. Chem Conf, Halifax, N.-É.; 31 mai-3 juin 1981.

Présentation de la mise au point d'un processus à l'échelle du laboratoire (lot) permettant d'améliorer l'efficacité de la combustion de charbons riches en matières inertes oxydées avec un gaz réducteur dans certaines conditions. Les produits obtenus grâce à ce procédé confirment la tendance à l'obtention d'une combustion efficace. La quantité de carbone non brûlé dans les escarbilles et le produit résiduel a été réduite de 20% à 0,5%.

102 Poirier, M.A. et George, A.E. "A rapid method for the determination of asphaltenes content in Western Canada bitumens using thin layer chromatography"; Procès-verbal du 28th Confr Int Union of Pure and Appl Chem, Paper No. EP-23; Vancouver, 16-21 août 1981.

Présentation d'une méthode rapide de détermination de la teneur en asphaltenes des bitumes et des bitumes traités par application de la chromatographie à couches minces et de la colorimétrie. Cette méthode implique la séparation des asphaletenes des maltenes sur une plaque de chromatographie à couches minces. Les bandes d'asphaltenes sont éliminées de la plaque et extraites dans du toluène, et la concentration est déterminée par colorimétrie. Cette méthode s'applique à tous les pétroles solides et semi-solides, au gazolies, aux pétroles lourds et au pétrole brut qui a été étêté à 350°C ou à une température supérieure. Cette méthode a été appliquée aux bitumes de l'Athabasca, de Lloydminster et de Colk Lake, et à leurs produits de traitement contenant différentes quantités d'asphaltenes. On peut déterminer la teneur en asphaltènes comprise entre 0% et 100%. Les résultats sont comparés à ceux de la méthode classique IP.

103 Poirier, M.A. et George, A.E. "Olefin distribution in the naphtha products of processed Lloydminster oil"; Proc Pittsburgh Conf Analytical Chem and Appl Spectroscopy, Paper No. 047 Atlantic City, N.J.; 9-13 mars 1981.

104 Price, J.T., Gransden, J.F. et Brown, T.D. "Canadian R & D studies of partially briquetted coke oven charges - addition of non-coking coal and additives"; ERP/ERL 81-60(OPJ); 17th Biennial Conf, Inst Briquet Agglom, Reno, Nevade; 31 août-3 sept. 1981.

Ce document présente l'analyse des résultats d'une étude sur le briquettage partiel qui implique le briquettage d'un charbon ou d'un mélange de charbon et le mélange uniforme des briquettes avec du charbon ou un mélange de charbon meuble avant l'introduction dans le four à coke. On constate que l'on pourrait substituer environ 40 à 80% de coke de pétrole, de charbon thermique ou de semi-anthracite dans les briquettes ajoutées à la charge avant d'obtenir une diminution de la qualité du coke si on la compare à celle d'un mélange conventionnel.

105 Skubnik, M. and Whalley, B.J.P. "A consideration of coal slurry transportation for Canada"; ERP/ERL 81-12(OP); Proc 15th Biennial Conf of Int Cargo Handling Coord Assoc, Edmonton; 7-12 juin 1981.

On a envisagé l'application de la technique de transport par des boues dans des pipelines au Canada pour le transport du charbon vers la côte ouest pour exportation, vers l'Ontario pour production d'électricité et vers les champs de pétrole de l'ouest canadien pour utilisation dans les usines d'extraction et d'enrichissement. Le document présente la comparaison entre l'eau, le pétrole brut et le méthanol comme milieu de transport ainsi que leurs implications sur le plan de la disponibilité, de l'interaction charbon-liquide, de la séparation charbon-liquide, et de l'aspect économique des systèmes.

106 Teodosiu, G., Arsenault, R., Bellemore, G., Chornet, E., Bodd, S.L. et Kelly, J.F. "Development of a testing facility for direct hydrogenation of Canadian low rank coals"; ERP/ERL 81-41(OP); présenté à la 64th Conf Chem Inst Can., Halifax; 31 mai-3 juin 1981 et dans le 2nd World Congr of Chem Eng Proc II:71; 1981.

Ce document présente les travaux de recherche et de développement qui ont mené à la construction d'une installation d'essai à écoulement continu de 10 kg/h pour l'hydrogénation directe des charbons canadiens de faible qualité. On y traite d'un résumé des informations obtenues dans l'utilisation d'un autoclave fonctionnant au lignite de l'ouest canadien, des commentaires relatifs à la conception, à la construction, à la gamme des opérations ainsi qu'aux problèmes. Les résultats préliminaires et le bilan massique d'un cas particulier sont présentés.

107 Whaley, H. et Lee, G.K. "Dispersion parameters measured during neutral and stable conditons in Canada"; ERP/ERL 81-22(OP); présenté à la 74th Ann. Meet., Air Poll Control Assoc, Philadelphia, Pa, 21-26 juin 1981.

Ce document présente les résultats d'une étude entreprise par le laboratoire canadien de recherche sur la combustion afin de déterminer les paramètres de la dispersion atmosphérique des panaches en suspension émis par les cheminées élevées situées dans diverses régions du Canada caractérisées par un terrain plat, la proximité de grandes masses d'eau, un terrain ondulé ou des avant-monts, des vallées profondes, des régions arctiques et subarctiques. On procède ensuite à l'évaluation et à la comparaison de ces paramètres avec les prévisions établies par Pasquill et Gifford.

LABORATOIRES DE RECHERCHE EN MÉTALLURGIE PHYSIQUE

108 Buhr, R.K. "Inoculation of grey and ductile irons"; MRP/PMRL 81-56(OP)E; présenté à CANMET, atelier sur la fonte grise et malléable, Ottawa; déc. 1981.

Ce document décrit diverses techniques de traitement pour l'inoculation des fontes grises et malléables et donne la liste d'un certain nombre des inoculants les plus utilisés, ainsi que des compositions caractéristiques. Il indique aussi les effets des inoculants types sur la fonte grise.

109 Buhr, R.K. "New technology in grey and ductile irons"; MRP/PMRLA 81-60(OP); présenté à CANMET, atelier sur la fonte grise et malléable, Ottawa; déc. 1981.

Ce document souligne les récents progrès technologiques intéressant les fonderies canadiennes; fonte graphitée compacte, inoculation tardive, inoculation par jet, inoculation dans le moule, liants sableux dégradables, procédé CANCOAT.

110 Davis, K.G. "Alloyed grey and ductile cast irons"; MRP/PMRL 81-62(OP); présenté à CANMET, atelier sur la fonte grise et malléable, Ottawa; déc. 1981.

Ce document présente quatre catégories principales d'alliages de fer: fer contenant des additifs en quantité modérée pour améliorer la résistance à température ambiante; fer pour utilisation à des températures élevées; fer pour utilisation dans des milieux corrosifs et fer malléable à haute résistance traité thermiquement.

111 Davis, K.G. "Microstructure, heat treatment and properties of unalloyed grey and ductile cast irons"; MRP/PMRL 81-61(OP); présenté à CANMET, atelier sur la fonte grise et malléable, Ottawa, déc. 1981.

Une étude de la norme relative aux pièces moulées en fonte grise (ASTM A 48-76) montre que la fonte est un alliage qui présente des propriétés inhabituelles. Elle présente une flexibilité remarquable. L'application d'une méthode de moulage appropriée et d'un traitement de la poche de coulée, donnent des pièces aux propriétés très différentes en partant de la même composition de base. De plus, le fer graphité se prête tout particulièrement au moulage. Il a une excellente fluidité, un point de fusion assez bas, et une dilatation due à la formation de graphite pendant la solidification qui contrebalance à peu près la contraction totale de telle sorte que l'on peut maintenir à un minimum ou même complètement éliminer les évents.

112 Godden, M.J., Ruddle, G.E., Crawley, A.F. et Boyd, J.D. "Modification of the austenite grain structure in a Mn-Mo-Nb steel by Ti-N additions"; ERP/PMRL 81-44(OP); présenté à la Conf on Thermomech Proc Microalloyed Austenite, Pittsburgh, Pa; 18 août 1981.

Les auteurs ont étudié l'origine du mélange de dimensions des grains de ferrite dans un acier microallié et les effets particuliers de l'addition de Ti-N en trempant des échantillons à différentes étapes du laminage pour suivre les variations de la structure des grains d'austénite. Les résultats indiquent que la microstructure et les propriétés peuvent être obtenues dans une tôle en acier au Ti-N en appliquant un processus de traitement relativement simple.

113 Malis, T. et Chaturvedi, M.C. "Variations in grain boundary segregation for Al-8 Mg"; MRP/PMRL 82-1(OPJ); présenté à Ann Meet, Electron Microsc Soc Am, Washington, D.C.; 9-13 août 1982 et dans J Mat Sci.

La séparation des joints intergranulaires des atomes de Mg dans un alliage de Mg à 8% en poids d'al, de grande pureté, trempés à l'eau à la température de traitement thermique de la solution, a été étudiée par microanalyse aux rayons X à dispersion d'énergie dans un microscope électronique TEM/STEM. Un grand nombre de joints intergranulaires ont montré une séparation des atomes de Mg deux ou trois fois supérieure à celle de la composition de l'alliage. A l'état trempé, le Mg est uniformément réparti le long des joints intergranulaires, mais il forme des amas pendant le vieillissement à température ambiante. Des bulles d'hydrogène sont souvent associées à ces régions riches en Mg. Les zones pauvres en Mg s'observent au voisinage de la plupart des joints, mais dans le plus grand nombre des cas d'un seul côté du joint.

114 Sahoo, M., Barry, J.R. et Kleinschmidt, K. "Use of ceramic foam filters in the brass and bronze foundry"; MRP/PMRL 81-15(OPJ); présenté à 85th AFS Casting, Cincinnati, OH; 27 avril 1981.

Ce document présente une étude de l'application possible de filtres en céramique-mousse pour le moulage des bronzes d'aluminium lorsque les inclusions de laitier présentent un problème. On a fabriqué des moulages de bronze d'aluminium de différentes conceptions à partir de différents alliages, en utilisant des moulages en double avec ou sans filtre dans le système d'obturation. Un examen visuel et radiographique montre que dans tous les cas les filtres réduisent de façon importante ou éliminent les inclusions d'oxyde et font la preuve du potentiel de ces filtres dans la production commerciale de moulages de bronze d'aluminium de première qualité.

115 Sastri, V.S., Beauprie, R. et Desgagné, M. "Studies on molybdate as pipeline corrosion inhibitor in coal water slurries"; ERP/PMRL 81-71(OPJ); présenté à la 7th Int Conf on Slurry Transportation, Las Vegas, Nevada; mars 1982.

Ce document traite de l'obtention des taux d'usure de l'acier AISI 1010 dans des coulis de charbon-eau en présence et en l'absence de molybdate de sodium. Les données obtenues sur les taux d'usure de l'AISI 1010 en fonction de variables comme le temps, le pH et la concentration de molybdate ainsi que 100 ppm de molybdate peuvent jouer le rôle d'inhibiteur pour un pH de 8,5. Parmi les systèmes binaires examinés, la combinaison de molybdate de sodium et de nitrite de sodium s'est révélée efficace pour la réduction de l'usure. Le système à composantes multiples, composé de molybdate de sodium, thiazole-mercaptobenza, sulfate de zinc et phosphate de sodium a donné les meilleurs résultats avec un taux d'usure ne dépassant pas 0,3 mm/a.

116 Shehata, M.T. et Boyd, J.D. "A technique to measure grain-size distributions in HSLA steels"; ERP/PMRL 81-41(OPJ); présenté à la Ann Meet Inst Metall Soc Conf, San Francisco, Ca; 21 juillet 1981.

Ce document présente une technique de mesure de la répartition dimensionnelle des grains de ferrite dans des matériaux dont les grains présentent des dimensions variables. On constate qu'une répartition bimodale de la dimension des grains peut être identifiée en reportant la répartition sur un graphique de probabilité logarithmique. Le rapport entre les répartitions de la dimension des grains à deux et à trois dimensions est alors étudié et il est démontré que la répartition dimensionnelle au niveau de la surface correspond bien à la répartition en trois dimensions au niveau des volumes.

117 Warda, R.D. "Cupola practice for grey and ductile iron"; MRP/PMRL 81-65(OP); présenté à CANMET, atelier sur la fonte grise et ductile, Ottawa; nov.-déc. 1981.

Les variables importantes de l'exploitation d'un cubilot sont identifiées et leur influence sur l'efficacité et le contrôle du cubilot sont examinées. Ces variables se divisent en trois groupes principaux: conception du cubilot, produits d'entrée dans le cubilot et produits de sortie du cubilot. Un quatrième groupe est formé des autres variables que affectent aussi de façon importante l'efficacité et le contrôle du cubilot.

118 Whiting, L.V., Sahoo, M. et Brown, D.A. "Structure and mechanical properties of aluminium bronze alloys cast in the ISO permanent test-bar mould"; MRP/PMRL 81-16(OPJ); AFS Trans 89:659-790; 1981.

L'ISO (1338-1977) a récemment établi des propriétés spécifiques de moulage permanent, et le lingot français a été adopté à titre de lingot standard fondu en coquilles (moule permanent). CANMET a alors entrepris de fabriquer et de mettre à l'essai un tel moule. Cinq alliages de bronze d'aluminium sont examinés en fonction de la teneur en aluminium conformément aux spécifications ASTM B148 et B505. On cite les résultats relatifs à certains alliages de cuivre à solidification rapide.

119 Whiting, L.V. "Ferrous foundry sand practice"; MRP/PMRL 81-66E(OP); présenté à l'atelier de travail sur la fonte grise, LRMP, Ottawa; nov.-déc. 1981.

Ce document traite des points fondamentaux relatifs aux sables de moulage et l'on constate la raison pour laquelle ils sont importants dans les moulages de la fonte grise et malléable. On indique les critères de sélection et d'essai du sable, des systèmes à sable à lien argileux et des systèmes à sable à lien chimique.

LABORATOIRES DE RECHERCHE MINIÈRE

120 Bigu, J. "Progress during 1981 in the environment projects for the CANMET Minerals Program"; MRP/MRL 81-72(OP); présenté au Joint Panel on Occupational and Environmental Research for Uranium Production in Canada, Elliot Lake; 16-17 juin 1981.

Ce document présente un résumé des principaux objectifs et résultats des projets environnementaux (souterrains et en surface) effectués par CANMET dans six domaines généraux: identification, mesure et contrôle des sources de rayonnement; identification, mesure et contrôle des bruits/vibrations; méthodes de traitement des résidus.

121 Bigu, J. "Continuous monitoring of radiation variables in the underground environment"; MRP/MRL 81-86(OP); présenté au Séminaire international sur le contrôle permanent, CANMET, Ottawa; 29 juillet 1981.

Brève revue des instruments servant au contrôle permanent des variables de rayonnement en environnement souterrain. On y indique les mérites, les inconvénients et les principales utilisations de ces instruments.

122 Bigu, J. "Mine models and the thoron problem in underground uranium mines"; MRP/MRL 81-112(OPJ); présenté à Int Conf on Radiation Hazards in Mining; Control, Measurement and Medical Aspects; Golden, Colorado; 4-9 octobre 1981.

Quelques modèles théoriques ont été utilisés pour la prévision des niveaux de rayonnement dans les mines souterraines d'uranium. Les calculs basés sur ces modèles ont été étendus de façon à inclure le thoron et ses dérivés. Les prévisions théoriques comprennent les dérivés du radon et du thoron, les niveaux de travail et les niveaux de concentration ainsi que certains rapports d'intérêt pratique importants. Les différences entre les modèles sont mises en évidence et l'on procède à une comparaison avec les données recueillies au cours des trois dernières années. On constate que plus d'un modèle permet de prévoir le même ou à peu près le même résultat pour une variable ou un rapport de variables de rayonnement donné.

123 Bossert, J.A. "Testing procedures for fire-resistant materials"; ERP/MRL 81-5(OPJ); présenté au CIM 84th Ann Gen Meet, Québec; avril 1982.

Ce document souligne les besoins d'essai du Comité directeur de l'Association canadienne de normalisation dans le cas de la sécurité électrique/mécanique dans les mines.

124 Cochrane, T.S. "Coal mining on Vancouver Island"; ERP/MRL 81-141(OPJ); présenté au Can Inst Min Metall Ann Meet, Québec; avril 1982.

Ce document présente une revue de l'historique de l'extraction du charbon dans l'île de Vancouver, et comprend une description de la géologie de l'île, des méthodes d'extraction, des contraintes et des commentaires sur la possibilité de relance de l'industrie.

125 Dainty, E.D. et Mogan, J.P. "A summary of the diesel vehicle emissions reduction program in Canada"; ERP/MRL 81-15(OPJ); présenté à la Safety in Mines Res Conf, Katowice, Pologne; 6-14 octobre 1981. (Sera publié dans le procès verbal.)

Ce document présente un résumé de diverses méthodes de réduction de la toxicité de l'échappement des moteurs diesel dans le cadre des conditions de santé et de sécurité sous terre étudiées à CANMET. L'évaluation des émissions toxiques se fait à l'aide de l'indice des effets sur la santé, principes qui traitent des effets synergétiques et additifs de quelques composants toxiques des échappements des moteurs diesel, y compris la question des particules.

126 Dainty, E.D. et Mogan, J.P. "Health and safety considerations related to the use of diesel-powered equipment in underground coal mines"; ERP/MRL 81-61(OP); présenté à "Inquiry into Underground Coal Mine Safety in Alberta" at Mine Environment/Mining Research into Safety Workshop; 23 juin 1981.

Présentation d'un exposé sur l'expérience réalisée dans le laboratoire canadien des atmosphères explosives de CANMET dans les domaines de la certification des moteurs diesel anti-déflagrants et de la R & D sur la réduction de la toxicité des émissions des échappements.

127 Dainty, E.D. et Mogan, J.P. "Summary of diesel exhaust emissions filter development at CANMET; MRP/MRL 81-118(OP); présenté au USBM/CANMET collaborative diesel emissions toxicity reduction demonstration planning group, Pittsburgh, Pa; 28 septembre 1981.

Ce document présente les résultats de deux essais de filtre effectués à CANMET sur un moteur diesel F6L 912W Deutz à faible émission. Les filtres soumis aux essais sont: (1) un filtre de type à fibres de verre imprégnées de graphite mis au point sur place à l'échelle normale et (2) un filtre à nids d'abeille en céramique fabriqué par Corning Glass. Le filtre Corning a été choisi pour un perfectionnement ultérieur.

128 Darling, J.A. "Burning trials of a test container protecting detonators from fire"; MRP/MRL 81-104(OP); présenté à la 21e Session Group of Experts on Explosives, Geneva; 12 octobre 1981.

Ce document décrit un essai de combustion d'un conteneur isotherme hermétique afin de déterminer les précautions nécessaires au transport sécuritaire de détonateurs et d'explosifs dans le même véhicule. On en conclut qu'un compartiment à détonateurs comprenant une paroi d'acier hermétique et une couverture complète de 2 cm d'épaisseur de fibres de verre pressées ne présente aucun danger particulier supplémentaire à ceux que existeraient si les détonateurs et les explosifs se trouvaient dans des chargements séparés.

129 Das, B. "Status of computer applications for underground coal mining methods evaluation"; ERP/MRL 81-35(OPJ); présenté à la 83rd Ann Gen Meet, Can Inst Min Metall, Calgary; 3-6 mai 1981.

On passe en revue l'utilisation des ordinateurs dans les méthodes d'extraction souterraine du charbon afin de définir les possibilités d'une application plus poussée. Ce document traite des rôles de l'ingénieur minier, du programmeur, de l'opérateur de l'ordinateur, de l'analyste et de l'ordinateur. Les paramètres importants sont identifiés et étudiés ainsi que leur application aux

diverses méthodes d'extraction souterraine du charbon selon les diverses méthodes, en particulier en ce qui touche les opérations d'exploitation à longue taille.

130 Davé, N.K., Lim, T.P. et Vivyurka, A.J. "Chemical and radioisotope distribution profiles in an abandoned uranium tailings pile"; MRP/MRL 81-109(OPJ); présenté à des séminaires sous le patronage de Saskatchewan Environment, Regina; 5 octobre et Saskatoon, 6 octobre 1981. Présenté aussi au 4th Symp on Uran Mill Tailings Management, Fort Collins, Colorado; 26-28 octobre 1981.

Une étude a été effectuée afin de déterminer l'orientation des profils de répartition chimique et des radioisotopes dans la phase solide d'un stock de résidus d'uranium abandonné à Elliot Lake, en Ontario. Des échantillons à noyau solide recueillis avec une cuillère fendue et des échantillonneurs à tube Shelby modifiés à différentes profondeurs sont analysés afin de déterminer divers constituants chimiques et radioisotopiques. Les résultats indiquent que la concentration des éléments chimiques et des radionucléides se situent près de la base de la couche de résidus qui est en contact avec l'eau interstitielle initiale. On a observé une faible pénétration de contaminants sous la couche de tourbe, à l'exception du gypse soluble due à la géologie de l'eau souterraine et à la capacité d'absorption de la couche de tourbe.

131 Feng, K.K., Chung, W.K., Yu, J.M. et Yu, B.C-Y. "Formation and distribution of hot spots in slurry explosives under projectile impact"; MRP/MRL 81-9(OPJ); présenté au 7th Symp (Int) on Detonation, U.S. Naval Academy, Annapolis, Maryland; 16-19 juin 1981. (Sera publié dans le procès-verbal.)

Le comportement de boues explosives de composition hypothétique sous l'impact de projectiles pendant la période de mise en place mais avant la combustion est étudié par application d'une méthode numérique. Les paramètres étudiés comprennent le rapport des explosifs solides/liquides, le pourcentage en volume de l'air, la dépendance par rapport à la température de l'effet des gaz entraînés autres que l'air, de la température initiale de l'explosif et de la vitesse des projectiles. On propose des quantités maximales d'air qui sont entraînées dans les boues explosives ayant des rapports solides/liquides différents qui peuvent être provoqués par les points chauds dus aux impacts dans les conditions étudiées.

132 Feng, K.K., Contestabile, E. et Craig, T.R. "Thermal conductivity of slurry explosives"; MRP/MRL 81-70(OPJ); présenté au 11th Symp on Explosives and Pyrotechnics, Philadelphia, Pa; 15-17 septembre 1981. (Sera publié dans le procès-verbal.)

Ce document présente l'application d'une méthode de détecteur à fil chaud transitoire pour déterminer la conductivité thermique des différents types de boues explosives dans leur emballage naturel. Les valeurs obtenues à partir du cycle de refroidissement correspondent bien à celles que l'on obtient à partir du cycle de réchauffement. On constate aussi que le vieillissement des échantillons diminue la conductivité thermique. Etant donné la reproductibilité et la précision des résultats expérimentaux ainsi que la conception sécuritaire de la sonde, cette méthode se révèle rapide et sûre.

133 Fisekci, M.Y. et Parkes, D. "Deformation analysis of underground openings and pillars during hydraulic mining of thick and steep seams in Western Canada"; ERP/MRL 82-7(OPJ); présenté à la 7th Int Strata Control Conf, Liège, Belgique; 20-24 septembre 1982.

L'exploitation d'un filon de charbon de 13 m d'épaisseur dont le pendage varie de 10 à 50° dans les montagnes Rocheuses a été effectuée par jet hydraulique. La mine comprend des sous-niveaux séparés de 25 m et remontant d'environ 7°. Les piliers formés sont ensuite exploités par rabattage au jet d'eau. On obtient des taux de production allant jusqu'à 8000 t/j avec une alimentation en provenance de deux pompes de 2500 H.P. La boue qui en résulte est filtrée avant d'être extraite par pompage du charbon à moins 4 mm avec l'eau. Une étude de contrôle au sol montre que la dernière partie de la mine hydraulique était exploitée dans les zones d'où les contraintes avaient été supprimées et où les pressions de culée étaient éloignées de la zone de travail par suite de l'effet de coussin de l'épaisse couche meuble de charbon préfracturé. La mécanique des couches est étudiée à l'aide d'extensomètres à fil et par la méthode d'enregistrement des pressions hydrauliques dans le charbon et les couches associées.

134 Herget, G. et Garg, O. "Research requirements in surface mine stability and planning"; MRP/MRL81-49(OPJ); présenté à la 3rd Int Conf on Stability in Surface Mining, Vancouver; 1-3 juin 1981.

Une étude des données publiées et des discussions avec les opérateurs et les planificateurs de l'exploitation minière montre que la tendance actuelle à la stagnation de la productivité des mines à ciel ouvert et l'augmentation des coûts ne peuvent être modifiées si l'industrie continue d'appliquer les techniques actuelles. Les quatre domaines suivants sont ceux qui se prêteraient le mieux à une amélioration des opérations d'exploitation à ciel ouvert au cours des années 1980: mise au point de systèmes plus économiques de transport du minerai et des résidus; amélioration des techniques de forage et de sautage; réduction du taux de décapelage; et optimisation de la planification de l'exploitation en utilisant des ordinateurs.

135 Kirk, B. "Eriometry as a dust measurement technique use in underground mines"; MRP/MRL 81-23(OPJ); présenté à la Conf on Lasers and Electro-Optics, Washington, D.C.; 10-12 juin 1981.

L'eriométrie permet de contrôler en permanence le niveau des poussières dans les mines souterraines. Ce document traite de la conception d'un eriomètre à bon marché qui peut facilement s'adapter à diverses tâches. On indique les résultats expérimentaux et les essais portant sur la précision et la reproductibilité du système.

136 Knight, G., Bigu, J., Mogan, P., et Stewart, D.B. "The size distribution of airborne dust in mines"; MRP/MRL 81-115(OPJ); présenté au Int Symp on Aerosols in the Mining and Indust Work Environment, Minneapolis, Minn.; 2-6 novembre 1981.

De la poussière en suspension dans l'air a été recueillie dans trois mines d'uranium sur des échantillonneurs à deux étages. La poussière a été étudiée par diffraction des rayons-X de façon à déterminer la présence de quartz et de minéraux et par scintillation et comptage quant à celle des dérivés du radon et du thoron. Les résultats montrent que ces derniers ne sont pas associés aux particules selon l'évaluation de masse.

137 Larocque, G.E. "Methodology overview - rock mechanics/rock properties"; MRP/MRL 81-144(OPJ); présenté à la 12th Nuclear Fuel Waste Management Information Meet, Univ. Waterloo; 27-28 janvier
1982 et dans le procès-verbal.

Ce document présente une description détaillée des travaux d'EMR sur les propriétés des roches et le besoin d'un programme global sur la mécanique des roches dans le cadre du Programme de gestion des déchets nucléaires à teneur élevée.

138 Mogan, J.P. et Dainty, E.D. "The implications for mine operators of Canadian diesel fuel trends
in the 80's"; ERP/MRL 81-108(OP); présenté à la 6th Ann District Meet, Can Inst Min Metall; 29-31 octobre 1981.

Les nouvelles normes générales canadiennes relatives aux combustibles diesel doivent recouvrir une plus vaste gamme d'hydrocarbures, élargissant ainsi les possibilités d'approvisionnement. Les limites révisées qui auront un impact sur l'exploitation minière souterraine portent sur le point d'éclair (inférieur), le point de trouble et le point d'écoulement (plus variables), la gamme de distillation (plus large), la teneur en soufre (limite inférieure, tendance supérieure)
et l'indice de cétane (inférieur). D'une façon générale, on peut s'attendre à ce que le changement des propriétés des combustibles entraîne une présence plus élevée de polluants dans les échappements des moteurs diesel. Une "norme supérieur" pour les combustibles servant à l'exploitation minière est proposée afin de maintenir les émissions des échappements à leur niveau actuel.

139 Mogan, J.P., Katsuyama, K. et Dainty, E.D. "The emission control system on the Volvo BM 861 U underground truck"; MRP/MRL 81-30(OPJ); présenté à la 83rd Ann Gen Meet, Can Inst Min Metall, Calgary; mai 1981.

Présentation d'un résumé sur le rendement des composantes de l'unité Volvo BM 861, selon une évaluation effectuée par des essais dynamométriques grandeur réelle. Ces unités sont fabriquées sous le même nom que le constructeur des moteurs, ce qui permet une interaction des caractéristiques du système dans son ensemble (moteur suralimenté par turbines à refroidissement complémentaire, transmission et épurateur d'échappement) de façon à maintenir au minimum les niveaux d'émission.

140 Morin, K.A., Cherry, J.A., Lim, T.P. et Vivyurka, A.J. "Contaminant migration in a sand aquifer
near an inactive uranium tailings impoundment, Elliot Lake, Ontario"; MRP/MRL 81-114(OPJ); présenté aux seminaires parrainés par Saskatchewan Environment, Regina; 5 octobre et Saskatoon,; 6 octobre 1981 et dans Can Geotech J 19:1; 1982.

Pour évaluer les schémas de l'abandon final des déchets de traitement d'uranium et leur impact sur l'environnement, on procède à une étude du mouvement d'eau souterraine contaminée provenant de déchets d'uranium inactif et passant dans une nappe de sable aquifère à l'emplacement du dépôt de déchets de Nordic Main près d'Elliot Lake, en Ontario. En 1979-1980, un réseau de piezomètres de type à fuseaux et à niveau multiple a été installé dans l'aquifère. Les données obtenues en 1980 prouvent pour la première fois directement un mouvement de panache en comparant la répartition des contaminants en 1979 et en 1980.

141 Pathak, J. "Haulage related accidents in Canada"; MRP/MRL 81-39(OP); présenté à la 50th Ann Meet, MAPAO, Toronto; 20-22 mai 1981.

Ce document présente une comparaison entre les blessures causées dans le cadre du transport et du contrôle au sol par rapport aux statistiques sur les accidents dans les mines souterraines de roche dure. Les relevés des accidents dans les mines dans différentes provinces du Canada, aux États-Unis, en Afrique du Sud et en Suède sont comparés sur la base des blessures mortelles et indemnisables par 10^6 heures/hommes. On analyse ensuite les fréquences de blessures dans le cas de l'équipement et des convoyeurs avec et sans voie et l'on isole les causes principales. Suit une recommandation sur la prévention des accidents dans le cadre du transport.

142 Sabourin, R. "Geostatistics, as a tool to define various categories of resources"; ERP/MRL 81-111(OPJ); présenté au 10th Geochautauqua on Computer Applications in the Earth Sciences sous le patronage de la CGC; 23-24 octobre 1981.

Les définitions des ressources "mesurées et indiquées" sont généralement vagues. Le calcul de ces catégories de ressources dans les gisements de minéraux nécessite donc l'intervention de critères techniques spécifiques, dont le choix dépend de la méthode d'évaluation. Ce document montre comment une méthodologie géostatistique permet d'obtenir les critères techniques nécessaires à la classification des ressources raisonnablement assurées par niveaux d'assurance de leur existence.

143 Savich, M.U. "New generation of noise dosimeters in Canadian mines"; MRP/MRL 81-106(OP); présenté au Canadian Acoustical Assoc Ann Symp, Edmonton, Alberta; 8-9 octobre 1981.

Ce document fait état des progrès enregistrés dans le domaine de la diminution des bruits au cours des dix dernières années. On y donne des exemples sur le rôle important des programmes informatiques.

144 Srajer, V. et Chiang, C. "The development and application of a model for preliminary selection of bucket wheel excavator"; ERP/MRL 81-13(OP); présenté à la 84th Ann Gen Meet, CIM, Québec; 25-28 avril 1982.

Description de six programmes informatiques servant de base au choix d'un excavateur à godets de façon à répondre à divers types de mines.

SECTION 4

RAPPORTS DE DIVISION

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LABORATOIRES DES SCIENCES MINÉRALES

RAPPORTS TECHNIQUES (TR)

145 MRP/MSL 78-123(TR). Steger, H.F. "The effect of temperature, pH, paraticle size and air flow on the formation of thiosalts in sulphide mineral suspension"

146 ERP/MSL 80-158(TR). Ritcey, G.M. "Proceedings of the meeting of the Canadian Uranium Producers' metallurgical committee held in Ottawa"

147 MRP/MSL 81-4(TR). Hughson, M.R. "Size analyses of sphalerite, galena and chalcopyrite in drill cores from the east sulphide body of the Caribou deposit, New Brunswick"

148 MRP/MSL 81-8(TR). Bartels, K. "UV spectral characteristics of selected thiosalts"

149 ERP/MSL 81-11(TR). Wheat, T.A. "The CANMET Program to develop solid electrolytes"

150 MRP/MSL 81-15(TR). Bowman, W.S. et Sutarno, R. "Personal dust sampling in mines: Normality test for quartz dust"

151 MRP/MSL 81-17(TR). Silver, M. et Taylor, J.B. "Assessment of the microbial populations in field and test pit experiments at Elliot Lake, Ontario, Canada"

152 MRP/MSL 81-18(TR). Palmer, J. "Cost estimates for producing alumina by a soda-lime sinter process using Hat Creek coaly waste as the source of both alumina and energy"

153 ERP/MSL 81-35(TR). Haque, K.E. "Hydrochloric acid leaching of a Bancroft uranium ore"

154 MRP/MSL 81-37(TR). MacKinnon, D.J. et Brannen, J.M. "The effect of cobalt on zinc deposit structures electrowon from industrial acid sulphate electrolytes"

155 ERP/MSL 81-43(TR). Haque, K.E. "Chlorine-assisted leaching of Key Lake uranium ore"

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534 IR 65-109. Cabri, L.J. "Mineralogical investigation of a copper-nickel ore from Axis Lake, Saskatchewan"

535 IR 66-3. Hartman, F.H. et Wyman, R.A. "Beneficiation of fluorite from Udaipur, India"

536 IR 66-7. Riley, G.W. "Gravity concentration of a chromite ore from Bourret Explorations, Thetford Mines, Quebec"

537 IR 66-11. Riley, G.W. "Magnetic concentration of magnetically roasted ore from Steep Rock Iron Mines Ltd., Atikokan, Ontario"

538 IR 66-14. Riley G.W. "Mineralogical investigation of a cobalt-nickel ore from the Rusty Lake Mine in the Gowganda area, Ont."

539 IR 66-25. Zoldners, N.G. "Evaluation of three materials from British Columbia for use as natural pozzolans"

540 IR 66-26. Cabri, L.J. "Mineralogical investigation of a copper-nickel ore from the E-L Mine, Iskut River area, northern B.C."

541 IR 66-27. Hartman, F.H. "Recovery of carbon and other products from fly ash"

542 IR 66-28. Hanes, F.E. "Assessment of a trap rock from Montreal for use as a concrete aggregate"

543 IR 66-29. Mathieu, G.I. "Investigation of a copper-nickel ore from Axis Lake area of northern Saskatchewan for Placid Oil Co., Calgary"

544 IR 66-30. Mathieu, G.I. "Evaluation of the flotation characteristics of a copper-gold-silver ore from Lucky Luke Mine, Usk, B.C."

545 IR 66-31. Owens, D. et Petruk, W. "Mineralogical examination of copper ore from the Lucky Lake mine"

546 IR 66-35. Riley, G.W. et Page, A. "Beneficiation tests on an iron ore from the Bear River property of Pacific Giant Steel Ore Ltd., Whitehorse, Y.T."

547 IR 66-37. Wilson, H.S. "Pelletizing expanded perlite fines"

548 IR 64-44. Riley, G.W. "Pilot plant investigation on samples of Phillipine chrome ore fines submitted by Canadian Refractories Ltd."

549 IR 66-46. Petruk. W. "Mineralogical investigation of a molybdenum-bismuth ore from the Preissac area in Quebec for Moly Hill Mining Corporation"

550 IR 66-50. Petruk, W. "Mineralogical investigation of a zinc-lead ore from the Pine Point area for Pyramid Mining Co. Ltd."

551 IR 66-51. Soles, J.A. "Petrography of limestone drill core from St. Constant, P.Q."

552 IR 66-60. Stemerowicz, A. "Concentration of copper-nickel ore from Lorraine Mining Co. Ltd., Bellterre area, Quebec"

553 IR 66-62. Stemerowicz, A. "Pilot plant investigation of nickel-copper ore from the Strathcona property of Falconbridge Nickel Mines Ltd., Falconbridge, Ontario"

554 IR 66-63. Berry, T.F. "Pilot plant investigation of a Cu-Pb-Zn ore from Cupra Mines Ltd., Stratford Centre, Quebec"

555 IR 66-64. Berry, T.F. "Work index determination of Nordic ore for Rio Algom Mines Ltd., Elliot Lake, Ontario"

556 IR 66-68. Owens, D. "Mineralogical examination of zinc ore from the Schreiber area of Ontario submitted by Zenmac Metal Mines Ltd."

557 IR 66-70. Owens, D. "Mineralogical examination of a titaniferous iron ore from Lake St. John, Quebec submitted by Titanium Products Corporation"

558 IR 66-75. Hanes, F.E. et Soles, J.A. "Suitability of the buff and red sandstone from Trois-Pistoles, Quebec, for use as a dimension stone"

559 IR 66-77. Boisonnault, A.J. "Upgrading silver concentrates from Cobalt Refinery Ltd., Cobalt, Ontario"

560 IR 66-79. Hartman, F.H. "Beneficiation of graphite from Quebec"

561 IR 66-80. Winer, A.A. "Examination of lead-meta-niobate samples submitted by Duplate Canada Ltd., Research Labs, Oshawa, Ont."

562 IR 66-83. Mathieu, G.I. "Investigation of a gold-cobalt-bismuth ore from the Marian River area for Precambrian Mining Services Ltd., Yellowknife, N.W.T."

563 IR 66-92. Sirois, L.L., Page, A. et Raicevic, D. "Calcite flotation of pyrochlore ore from St. Lawrence Columbium and Metals Corporation, Oka, Quebec"

564 IR 66-9. Berry, T.F. "Concentration of a cobalt-nickel ore from Rusty Lake Mining Corporation Ltd., Gowganda, Ontario"

565 IR 66-100. Wyman, R.A. "Tabling tests on barite-fluorite samples from Lake Ainslie, N.S."

566 IR 67-6. Wilson, H.S. "Assessment of shales and slates from N.B. for production of lightweight aggregate"

567 IR 67-14. Mathieu, G.I. "Recovery of gold from old mill tailings for M.S.M. Minerals Ltd., Kirkland Lake, Ontario"

568 IR 67-17. Llewellyn, T.O. "Concentration of magnetite ore from Jaybee Landry Exploration and Mining Co. Ltd., Sudbury, Ontario"

569 IR 67-18. Stemerowicz, A. "Investigation of lead-zinc and copper-zinc ores from the Kidd Township property of Texas Gulf Sulphur Company"

570 IR 67-19. Hanes, F.E. "Sand manufacturing from an Ottawa Valley limestone"

571 IR 67-27. Mathieu, G.I. "Laboratory and pilot plant investigation on molybdenite-bismuth ore from Moly Hill Mining Corporation Ltd., Rouyn, Quebec"

572 IR 67-32. Wilson, H.S. et Buchanan, R.M. "Appraisal of a volcanic material as lightweight aggregate"

573 IR 67-33. Riley, G.W. "Jigging investigation of upgraded ore from Crest Exploration Ltd."

574 IR 67-38. Winer, A.A., Page, A. et Sirois, L.L. "A study of surface characteristics of selected asbestos fibre by electrophoresis"

575 IR 67-43. Wall, Arthur W. "A laboratory and pilot plant investigation on silver concentrate from Cobalt Refinery Division, Kam-Kotia Mines Ltd., Cobalt, Ontario"

576 IR 67-46. Sutarno, R., Bowman, W., Tippins, J. et Alexander, G.E. "Ferrites: Part III. Construction and operation of a magnetic orienting press for the fabrication of anisotropic ferrite magnets"

577 IR 67-50. Mathieu, G.I. "Investigation of a gold-silver ore from the Lynn Lake, Manitoba property of Agassiz Mines Ltd."

578 IR 67-54. Owens, D. "Mineralogical examination of a copper ore from Caribou Bell Copper Mines Limited, Vancouver, British Columbia"

579 IR 67-55. Mathieu, G.I. "Recovery of silver and zinc from two ore samples from Creswell Mines Limited, Port Arthur, Ontario"

580 IR 67-60. Mathieu, G.I. "Investigation of a low-grade nickel mineralization from Sutherland and Associates, Blind River, Ontario"

581 IR 67-63. Stemerowicz, A. "Pilot plant investigation of copper-nickel ore from Great Lakes Nickel Corporation Ltd., Pardee Tp., Thunder Bay District, Ontario"

582 IR 67-77. Stemerowicz, A. et Bruce, R.W. "Concentration of a copper ore from the Canam property of Giant Mascot Mines Limited, Hope, B.C."

583 IR 67-88. Mathieu, G.I. et Bruce, R.W. "Flotation investigation on a gold ore from Campbell Red Lake Mines Ltd., Balmertown, Ontario"

584 IR 67-92. Stemerowicz, A. et Bruce, R.W. "Concentration of a copper ore from the R.M. Clarke Mining Co. Ltd., Parry Sound, Ontario"

585 IR 68-5. Mathieu, G.I. et Bruce, R.W. "Investigation of gold-silver-copper ore from Pyrotex Mining & Exploration Co., Ltd., North Caribou Lake, Ontario"

586 IR 68-67. Sirianni, G.V. "Electric smelting of nickeliferous magnetite in the 60-KAV electric arc-furnace to produce low-grade ferronickel for Carey Canadian Mines Ltd., East Broughton, Quebec"

587 IR 68-70. Hartman, F.H. et Wyman, R.A. "Beneficiation of barite-fluorite from Lake Ainslie, Nova Scotia (Project MP-MIL-207)"

588 IR 68-78. Riley, G.W. "Recovery of iron from an iron-rich reject sample of Carey-Canadian Mines Limited, East Broughton Station, Quebec"

589 IR 69-19. Owens, D. "Mineralogical investigation of a sample of a tungsten ore from York County, N.B. on behalf of Burnt Hill Tungsten and Metallurgical Limited"

590 IR 69-33. McNamara, V.M., Weston, T.B. et Webster, A.H. "Lead zirconate-titanate ceramics prepared from co-precipitated powders modified with strontium, iron and chromium oxides"

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592 IR 69-56. Riley, G.W. "Concentration tests on a pyrochlore from Argor Explorations Limited"

593 IR 69-82. Sutarno, R., Bowman, W.S. et Alexander, G.E. "Investigation of the use of by-product iron oxide in "Hard" ferrite manufacture, on behalf of the Steel Company of Canada Limited, Hamilton, Ontario"

594 IR 69-84. Wilson, H.S. "Assessment of vermiculite-bearing drill-core samples from Stanleyville, Ontario"

595 IR 70-2. Godfrey, K.V. "The application of a portable X-ray fluorescence analyzer to the control of a grinding circuit"

596 IR 70-6. Mathieu, G.I. et Bruce, R.W. "High-intensity-magnetic separation of a tungsten ore, from the Grey River property of American Smelting and Refining Company, Buchans, Newfoundland"

597 IR 70-10. Owens, D.R. "Mineralogical investigation of a sample of zinc-lead-copper ore from Cadillac Explorations Limited, Prairie Creek, N.W.T."

598 IR 70-20. Hanes, F.E. "Assessment of a black granite rock from the Peribonka area, P.Q., for use as monumental and building stone"

599 IR 70-49. Vaughan, D.J. "Investigation of reduced Dominican Republic ore by Mossbauer spectroscopy for Falconbridge Nickel Mines Limited"

600 IR 70-62. Owens, D. "Mineralogical investigation of a sample of nickel-copper ore from the Nicopor property of Zenmac Metal Mines Limited, Schreiber, Ontario"

601 IR 71-22. Pinard, R.G. "Mineralogical investigation of a lead-zinc-silver ore from the Reeves-MacDonald Mines Limited, Prairie Creek, N.W.T."

602 IR 71-25. Nickel, E.H. "Mineralogical evaluation of iron concentrates from the Iron Ore Company of Canada, Schefferville, Quebec"

603 IR 71-27. Harris, D.C. "Mineralogical investigation of the low-grade nickel-bearing serpentinite of Dumont Nickel Corporation, Val d'Or, Quebec"

604 IR 71-31. Palfreyman, M. "Further evaluation of a British Columbia magnesite as a refractory raw material"

605 IR 71-38. Nickel, E.H. "The occurrence of nickel in ore samples from Dumbarton Mines Limited, Bird River, Manitoba"

606 IR 71-40. Wilson, H.S. "Assessment of vermiculite from vicinity of Venosta, Quebec"

607 IR 71-70. Raicevic, D. et Bruce, R.W. "Tungsten concentration from Grey River property of American Smelting and Refining Company, Newfoundland"

608 IR 71-80. Harris, D.C. "Mineralogical investigation of a nickel-copper pipe ore for International Nickel Company of Canada, Thompson, Manitoba"

609 IR 71-81. Soles, James A. "A petrographic investigation of soil gravel from the site of the proposed international airport, St. Scholastique, Quebec"

610 IR 71-83. Wyman, R.A. et Hartman, F.H. "Examination of a bulk sample of kimberlite for diamond content"

611 IR 72-13. Owens, D.R. "Mineralogical investigation of an antimony ore from a deposit located in South Ham Township, Quebec, on behalf of Quebec Antimony Mines Limited"

612 IR 72-20. Johnson, A.E. "Mineralogical investigation of a gold-silver ore from Kleanza Mountain Terrace area, British Columbia"

613 IR 72-37. Harris, D.C. "Mineralogical investigation of a Cu-Ag ore of Terra Mining and Exploration, Camsell River, Northwest Territories"

614 IR 72-39. Harris, D.C. "Mineralogical examination of a coarse tantalum concentrate from Tantalum Mining Corporation (Tanco), Bernic Lake, Manitoba"

615 IR 72-53. Harris, D.C. "Mineralogical examination of a low-grade Ni-Cu-bearing peridotite from the Mattagami Lake Mine, Mattagami, Quebec"

616 IR 72-54. Harris, D.C. "Mineralogical examination of tantalum concentrates, DR-9 and DR-10, from the Tantalum Mining Corporation of Canada Limited (Tanco), Bernic Lake, Manitoba"

617 IR 72-57. Cabri, L.J. et Laflamme, J.H.G. "Mineralogical investigation of low-grade nickel drill core from claims near Giant Mascot Mines Limited, British Columbia"

618 IR 72-75. Bailey, R.P. "Comparative gold precipitation tests on "Durham Ultrafine" and "Durham Standard" zinc dusts submitted by Dillons Chemical Co. Ltd., Montreal, Quebec"

619 IR 73-2. Berry, T.F. "Gold losses in the treatment of a placer deposit in the Ashcroft area of British Columbia"

620 IR 73-6. Mathieu, G.I. et Bruce, R.W. "Flowsheet development for processing an antimony ore from South Ham Township, Quebec"

621 IR 73-13. Zoldners, N.G. et Painter, K.E. "Pelletized expanded-slag aggregate for structural lightweight concrete"

622 IR 73-17. Cabri, L.J. "Mineralogical investigation of hand samples from the Strathcona lead-zinc deposit, Baffin Island"

623 IR 73-27. Harris, D.C. "Mineralogical investigation of a Cu-Ag-Bi ore from Terra Mining and Exploration Limited, Camsell River, Northwest Territories"

624 IR 73-41. Johnson, A.E. "Mineralogical investigation of sulphurous coal from the Lingan Mines, Cape Breton Island, Nova Scotia"

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626 IR 73-65. Atkinson, K.D. "Laboratory support for spodumene pilot plant trials"

627 IR 73-72. Collings, R.K. et Brown, G.A. "The feasibility of producing a dry-pressed building brick with tailings from a Quebec iron mine"

628 IR 74-19. Klymowsky, I.B. "An investigation to determine causes for the variation in the flotation behaviour of iron ore from Schefferville, Quebec"

629 IR 74-44. Hartman, F.H. et Wyman, R.A. "Beneficiation of graphite from Mont Laurier, Quebec (Project MP-IM-7106)"

630 IR 74-49. Raicevic, D. et Bruce, R.W. "Determination of gold and platinum content in a low-grade alluvial gravel from the Tulameen River area of British Columbia"

631 IR 74-72. Palfreyman, M. "Evaluation of an Ontario dolomite as a refractory raw material"

632 MRP/MSL 75-1(IR). Feasby, D.G. "Utilization of waste: experimental production of bricks for dicalcium silicate slag"

633 MRP/MSL 75-2(IR). Churchill, T.R. et Mason, G.L. "Homogeneity tests on copper and copper alloys"

634 MRP/MSL 75-4(IR). Weston, T.B. "Microwave dielectric studies program"

635 MRP/MSL 75-6(TR). Owens, D.R. "Mineralogical investigation of a gold-bearing jig concentrate on behalf of Dome Mines Limited"

636 MRP/MSL 75-8(IR). Raicevic, D. "Evaluation of processes for recovery of chromium from Bird River chromite deposits"

637 MRP/MSL 75-11(IR). Mathieu, G.I. et Bruce, R.W. "Comparison of high-intensity magnetic separators for recovery of iron-bearing spodumene from tailings of a former lithium producer, Abitibi-East, Quebec"

638 MRP/MSL 75-12(IR). Kaiman, S. "Zyglo test on a radioactive pegmatite ore from Bancroft, Ontario"

639 MRP/MSL 76-1(IR). Mathieu, G.I., Berry, T.F. et Bruce, R.W. "Recovery of tungsten, molybdenum and bismuth minerals from the Brunswick Tin Mines property in southwestern New Brunswick"

640 76-5(IR). McNamara, V.M. "Cyanide pollution abatement project - The treatment of Canadian gold mill filter-press barrens - A status report"

641 MRP/MSL 76-6(TR). Owens, D. "Mineralogical and electron microprobe studies of leached residues resulting from hydrometallurgical tests on a roasted titaniferous magnetite concentrate"

642 MRP/MSL 76-8(IR). Ritcey, G.M. et Lucas, B.H. "Treatment of mingan titaniferous magnetite for the separation and recovery of chromium, vandium and aluminum by roast-leach-solvent extraction"

643 MRP/MSL 76-9(FT). Berry, E.E. "Visit to fly ash producers and users in Alberta and Saskatchewan"

644 MRP/MSL 76-11(IR). Klymowsky, I.B. "The flotation of Peace River iron ore"

645 MRP/MSL 76-12(IR). Wall, W.A. "Investigation of Peace River ore by tabling and magnetic separation"

646 MRP/MSL 76-15(C). Buchanan, R.M. "The 78th Annual General Meeting of the Canadian Institute of Mining and Metallurgy, Quebec, P.Q., April 25-29, 1976"

647 MRP/MSL 76-18(TR). Prud'Homme, P. "Mineral wool production from steel slag"

648 IR 76-1. Gilmore, A.J. "The removal of cyanide and metal-cyanide complexes from cyanidation wastes by fixed-bed ion-exchange technology"

649 MRP/MSL 76-20(IR). Kaiman, S. et Petruk, W. "Mineralogical investigation of ore from the Santa Lucia Zn-Pb deposit, Cuba"

650 MRP/MSL 76-21(TR). Malhotra, V.M. "A case for the Mineral Sciences Laboratories, CANMET"

651 MRP/MSL 76-22(IR). Winer, A.A. "A study of steel slag material for mineral wool manufacture"

652 MRP/MSL 76-25(TR). Berry, T.F. "Discussions concerning the feasibility of processing the ore from Brunwick Tin Mines Ltd. Meeting held in the offices of Sullivan Mining Group Ltd., Montreal, Aug. 26-27, 1976"

653 MRP/MSL 76-26(IR). Gilmore, A.J. "The ion-exchange removal of cyanide from gold-mill wastes for environmental benefit"

654 MRP/MSL 76-27(IR). Berry, T.F. "Upgrading a concentrate from the Brunswick Tin Mines property, southwestern New Brunswick"

655 MRP/MSL 76-28(IR). Petruk, W. et Pinard, R.G. "Image analysis study and evaluation of hematite in tailings from the Mount Weight Concentration, Quebec Cartier Mining Company"

656 MRP/MSL 76-29(IR). Petruk, W., Pinard, R.G. et Owens, D.R. "Image analysis and mineralogical evaluation of ore and mill products from Brouillan Township, Quebec for Selco Mines Limited"

657 MRP/MSL 76-30(IR). Green, D.J. et Wheat, T.A. "Synthesis of beta"-alumina using a freeze-dry technique"

658 MRP/MSL 76-31(TR). Bell, K.E. "Pyrometric cone equivalents of samples submitted by Quebec Iron and Titanium Corporation, Sorel, P.Q."

659 IR 77-5. Craigen, W.J.S. et Kelly, F.J. "Economic evaluation of cyanide removal processes"

660 IR 77-15. Ritcey, G.M. "Treatment of gold mill effluents for removal and recovery or destruction of cyanide - A summary of the joint project with six gold mills"

661 ERP/MSL 77-36(IR). Skeaff, J.M. "Survey of the occurrence of Ra-226 in the Rio Algom Quirke I Uranium Mill, Elliot Lake"

662 MRP/MSL 78-7(IR). Collings, R.K. et Brown, G.A. "Evaluation of fluorogypsum for gypsum products manufacture"

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664 ERP/ERL 81-11. Jorgensen, J.G., Lloyd, T.A. et Fung, A.B. "An investigation of the caking and coking properties of a coal sample from mine 9A-H, Smoky River property, submitted by McIntyre Mines Limited"

665 ERP/ERL 81-16. Whaley, H., Prokopuk, R., Banks, G.N. et Lee, G.K. "Pilot-scale evaluation of flame stability and heat transfer characteristics of milled wood shavings"

666 ERP/ERL 81-17. Lee, G.K., Prokopuk, R., Whaley, H. et Banks, G.N. "Combustion trials with Sage Creek coal Phase I - Preliminary assessment of a 65:35 blend of a No. 4 upper and No. 4 lower seams in a pilot-scale utility boiler"

667 ERP/ERL 81-18. Jorgensen, J.G., Lloyd, T.A. et Fung, A.B. "An investigation of the caking and coking characteristics of a coal sample from seam No. 2, North Hill, Sage Creek submitted by Techman Ltd."

668 ERP/ERL 81-47. Banks, G.N., Prokopuk, R., Whaley, H. et Lee, G.K. "Combustion evaluation of Quintette coal in a pilot-scale utility boiler"

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SECTION 7

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Les rapports suivants ne sont pas disponibles au CANMET. On peut cependent en obtenir des copies en s'adressant directement à l'auteur.

737 Mantel, J.H. et Archibald, J.F. "Determination of relaxation length in materials associated with uranium mining" Kingston, Université Queen's, Département des mines et du génie, février 1982
Agreement 15-2-81 - 53 p.

738 Gendzwill, D.J., Horner, R.B. et Hasegawa, H.S. "Induced earthquakes at a potash mine near Saskatoon, Canada" Saskatoon, University of Saskatchewan, Département de géologie, 1981
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Zinc-plomb-cuivre (597)
Zirpsio/céramique (087)
Zirpsios/sodium (088)
Zn-Pn-Cu-Ag (159)
ZrO_2/poudres (201)

SONDAGE

L'opinion des lecteurs intéressés peut influencer l'orientation future des recherches à CANMET.

Nous vous invitons, donc, à évaluer le rapport - n° _____

Est-il utile?	Oui____	Non____
Traite-t-il d'un problème de l'industrie?	Oui____	Non____
Le sujet est-il prioritaire?	Oui____	Non____

Commentaires _____

_____

_____

Postez à: Rédacteur de CANMET, EMR, 555, rue Booth,
Ottawa, Ontario, K1A 0G1

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